VOLUME 39 JULY 1946 NUMBER 7

Southern Medical Journal

Journal of the Southern Medical Association

Copyright, Southern Medical Association, 1946. Published monthly by the Southern Medical Association, Empire Building, Birmingham 3, Alabama. Annual subscription $4.00. Entered as Second-Class Matter at the Post Office at Birmingham, Alabama, under Act of March 3, 1879. Acceptance for mailing at special rate of postage provided for in Section 1103, Act of October 3, 1917, authorized December 20, 1921.

Southern Medical Association, Fortieth Annual Meeting, Miami, Florida, November 4-7

TABLE OF CONTENTS

Neurosurgical Experiences in the Lumbago-Sciatic Syndrome. Edgar F. Fincher, Atlanta, Georgia 527

History of Hemorrhoidal Surgery. Chesterfield J. Holley, Wheeling, West Virginia 536

Discussed by C. E. Howard, Cincinnati, Ohio; L. E. Moon, Omaha, Nebraska.

Spinal Anesthesia, with Special Reference to the Use of a Procaine-"Pontocaine" Mixture. Cecil E. Newell, Chattanooga, Tennessee 542

Discussed by John Adriani, New Orleans, Louisiana; Russell F. Bonham, Houston, Texas.

Aberrant Pancreas in the Duodenum. Jack C. Norris, Atlanta, Georgia 549

The Prevention and Control of Disturbances of Protein Metabolism in Rocky Mountain Spotted Fever: The Value of Forced Feedings of a High-Protein Diet and of the Administration of Specific Antiserum. George T. Harrell, William A. Wolff, William L. Venning and John B. Reinhart, Winston-Salem, North Carolina 551

Discussed by W. F. Burdick, Washington, D. C.; J. G. Van Dermark, Covington, Kentucky; (Miss) Mary Jane Dingledine, Winston-Salem, North Carolina.

Selective Radiation Obtained by the Intravenous Administration of Colloidal Radioactive Isotopes in Diseases of the Lymphoid System. P. F. Hahn and C. W. Sheppard, Nashville, Tennessee 558

Retention and Excretion of Manganese Dioxide Dispersions Administered Intravenously to Humans. C. W. Sheppard and P. F. Hahn, Nashville, Tennessee 562

The Use of Radium and Roentgen Rays in the Treatment of Hyperplastic Lymphoid Tissue in the Nasopharynx and Pharynx. Gilbert E. Fisher, Birmingham, Alabama 565

Discussed by R. W. Bledsoe, Covington, Kentucky; W. W. Wilkerson, Nashville, Tennessee; H. B. Searcy, Tuscaloosa, Alabama; C. E. Gillespie, Seymour, Indiana; S. M. Herron, Jackson, Tennessee; O. M. Marchman, Dallas, Texas; Edgar P. Cardwell, Newark, New Jersey.

Roentgenological Consideration of Gastro-Intestinal Disturbances with Special Reference to the Stomach and Duodenum. Roy G. Giles, San Antonio, Texas 570

Discussed by Vincent W. Archer, University, Virginia; Robert J. Reeves, Durham, North Carolina.

Perforated Peptic Ulcers in Naval Personnel. Shirley C. Lyons, New Orleans, Louisiana, and L. Gordon Sinclair, Raleigh, North Carolina 575

Estrogenic Hormones, Often Only a Psychotherapeutic Agent. John D. Weaver, Austin, Texas 581

Discussed by Waverly R. Payne, Newport News, Virginia; Lee F. Turlington, Birmingham, Alabama; F. O. Plunkett, Lynchburg, Virginia; Erwin Straehley, Jr., Cincinnati, Ohio.

Continued on Next Page

TABLE OF CONTENTS
Continued

Management of Some Common Obstetrical Complications in General Practice. Hoyt L. Choate, Little Rock, Arkansas 585

A Progress Note on Medical Education in South Carolina. William H. Kelley, Charleston, South Carolina 588

EDITORIALS 591
- Miami, Where We Meet
- The Wheat Shortage
- Estrogens and Bone Structure
- Twenty-Five Years Ago

BOOK REVIEWS 594

MIAMI—WHERE WE MEET 595
- Miami in November. Mr. Benton E. Jacobs, Miami, Florida.

SOUTHERN MEDICAL NEWS 596

The Tulane University of Louisiana School of Medicine

POSTGRADUATE COURSES

Opportunities are usually available for continuation study in most of the fields of Medical Practice.

For detailed information write

DIRECTOR

Division of Graduate Medicine

1430 Tulane Ave. **New Orleans 13, La.**

JUST READY NEW (2nd) EDITION

MASON & ZINTEL'S

PREOPERATIVE AND POSTOPERATIVE TREATMENT

Rewritten almost in its entirety for the New (2nd) Edition.

Includes new contributions on physical medicine in surgical practice; on care in gynecology, in surgery of stomach and duodenum and in intestinal obstruction; on nutrition in surgery; surgical risk in pregnancy; thrombophlebitis, vitamin K therapy and emergency care of cranial injuries.

Presents preoperative and postoperative care by regions of the body.

Includes psychic factors.

Contains an outstanding chapter on **Burns**, both minor and major, and including latest treatments.

Full details of laboratory findings in the blood and urine given in the Appendix. Presents full coverage of Anesthesia. Includes use of newest therapeutic agents. Contains 157 instructive illustrations.

Especially outstanding for the specific instructions given—such as on drug dosage, special procedures, how to prevent and treat complications, etc.

Increased utilization of applied physiology, biochemistry, bacteriology and pharmacology.

Edited by Lt. Col. Robert L. Mason, M.C., A.U.S., Cushing General Hospital, Framingham, Massachusetts; and Harold A. Zintel, M.D., Harrison Department of Surgical Research, University of Pennsylvania School of Medicine. 584 pages. $7.00.

SEND ORDERS TO

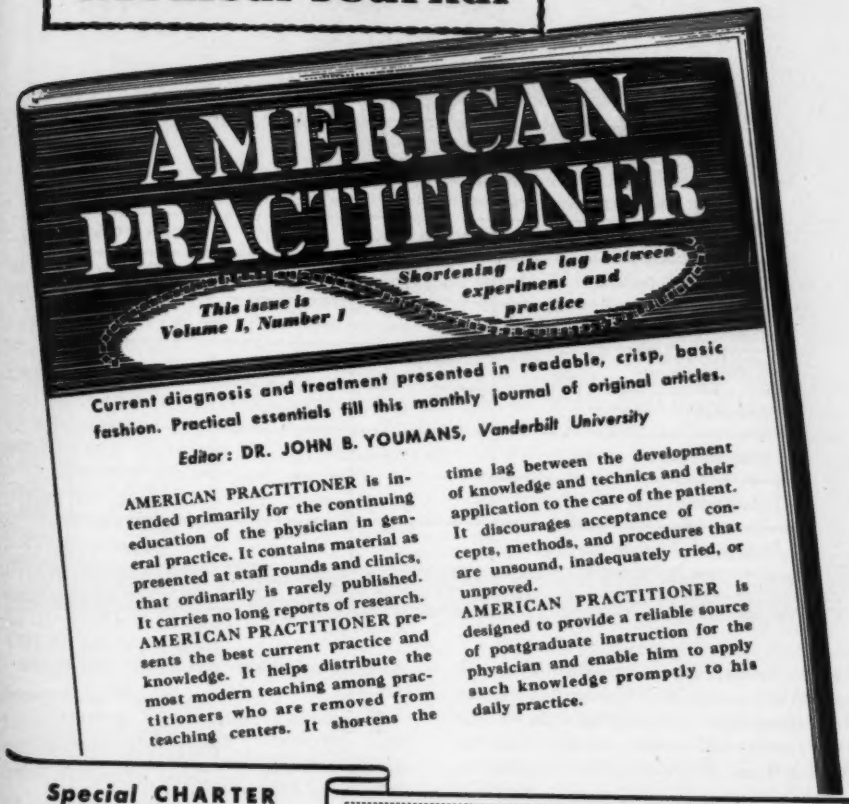
J. A. MAJORS COMPANY

NEW ORLEANS 13 **DALLAS 1**

LIPPINCOTT *Presents*

A New Monthly Medical Journal

Truly Applicable to General Practice



Current diagnosis and treatment presented in readable, crisp, basic fashion. Practical essentials fill this monthly journal of original articles.

Editor: DR. JOHN B. YOUMANS, *Vanderbilt University*

AMERICAN PRACTITIONER is intended primarily for the continuing education of the physician in general practice. It contains material as presented at staff rounds and clinics, that ordinarily is rarely published. It carries no long reports of research. AMERICAN PRACTITIONER presents the best current practice and knowledge. It helps distribute the most modern teaching among practitioners who are removed from teaching centers. It shortens the time lag between the development of knowledge and technics and their application to the care of the patient. It discourages acceptance of concepts, methods, and procedures that are unsound, inadequately tried, or unproved.

AMERICAN PRACTITIONER is designed to provide a reliable source of postgraduate instruction for the physician and enable him to apply such knowledge promptly to his daily practice.

Special CHARTER SUBSCRIPTION RATES

1 Year — 12 issues — Cash with order — $8.50
(15% saving over regular price)

1 Year — 12 issues — Charged to You — $9.00
(10% saving over regular price)

REGISTERED RATE OF $10.00 WILL APPLY AFTER PUBLICATION

J. B. Lippincott Company, E. Washington Square, Philadelphia 5, Pa. SMJ-746

REGISTER ME AS A CHARTER SUBSCRIBER TO AMERICAN PRACTITIONER
(Registered Rate $10.00 per year—12 issues)

SAVE ME 15% ☐ 1 year — 12 issues; payment enclosed $8.50
SAVE ME 10% ☐ 1 year — 12 issues; charge my account $9.00

These special charter subscription prices will expire shortly after publication of first issue

NAME_____

STREET ADDRESS_____

CITY, ZONE, STATE_____

AMERICAN PRACTITIONER entirely new, practical, and up-to-the-minute — ALWAYS!

new, nontoxic, **smaller dosage** sulfonamide

'SULFATHALIDINE'

Phthalylsulfathiazole

for **treatment of colon infections**

RESULTS OBTAINED WITH 'SULFATHALIDINE' PHTHALYLSULFATHIAZOLE*

DISEASE	GOOD 84%	FAIR 6%	POOR 10%
Chronic Ulcerative Colitis	20 acute 54 chronic	1 acute 1 chronic	1 acute 3 chronic
Bacillary Dysentery		2 chronic	
Giardia Lamblia	2 acute 6 chronic		
Paratyphoid		2 chronic	
Dientameba Fragilis	2 acute		
Amebic Colitis			4 acute 2 chronic
Total Number of Patients: 100	24 acute 60 chronic	1 acute 5 chronic	5 acute 5 chronic

Smaller dosage, nontoxicity, effective bacteriostasis are outstanding therapeutic features of 'Sulfathalidine' *phthalylsulfathiazole*, the new enteric sulfonamide developed by the Medical Research Division of Sharp & Dohme.

The new compound is indicated in the treatment of ulcerative colitis, regional ileitis, as a supplement to therapy of amebiasis, giardiasis, and paratyphoid infections, and as an adjunct to intestinal surgery.

'Sulfathalidine' *phthalylsulfathiazole* maintains a high bacteriostatic concentration in the gastrointestinal tract, profoundly reducing Escherichia coli, clostridia and related organisms. Only 5% of the ingested drug is absorbed and this is rapidly excreted by the kidneys.

Administered recently to 100 patients with colon infections, 'Sulfathalidine' *phthalylsulfathiazole* was effective in the treatment of 90.* The clinician reported:

"*It is my impression that phthalylsulfathiazole is less toxic and more bacteriostatic than any intestinal agent used previously and that, because it has these properties, smaller doses of the drug may be used to advantage.*"*

'Sulfathalidine' *phthalylsulfathiazole* is supplied in 0.5-Gm. compressed tablets in bottles of 100, 500, and 1,000. Sharp & Dohme, Philadelphia 1, Pa.

*J.A.M.A., *129*: 1080, Dec. 15, 1945

SHARP & DOHME

Just Released!

BANYAI'S
The PNEUMOPERITONEUM TREATMENT

by ANDREW LADISLAUS BANYAI, M.D., F.A.C.P., F.C.C.P., Associate Clinical Professor of Medicine, Marquette University Medical School, Milwaukee. 375 pages, 78 illustrations. Price, $6.50.

With simple, direct instructions and clear illustrations, this new book equips you to carry out successfully the pneumoperitoneum treatment.

During the past decade therapeutic pneumoperitoneum has gained a gradually increasing recognition and acceptance. The author feels, therefore, that its technique is a necessary knowledge, not only for the specialist, but for the general practitioner, especially with regard to the ambulatory patient.

Familiarize yourself now with this important procedure. Send for your copy of THE PNEUMOPERITONEUM TREATMENT today!

Synopsis of Contents

Historical Review. Technique of Peritoneum. Physiologic Changes Following. Intraperitoneal Pressure During Treatment. Peritoneal Changes During Pneumoperitoneum. Visceroptosis During Artificial Pneumoperitoneum. Air Embolism as a Complication. Accidental Pneumothorax During Pneumoperitoneum. Mediastinal Emphysema as a Complication of Artificial Pneumoperitoneum. Miscellaneous Complications. Pneumoperitoneum in Treatment of Tuberculous Peritonitis. In Treatment of Tuberculous Enterocolitis. Treatment of Pulmonary Tuberculosis with Artificial Pneumoperitonium. Miscellaneous Applications. Pneumoperitoneum in Treatment of Tuberculous Empyeme. Treatment of Tuberculous Salpingitis with Pneumoperitoneum. Pneumoperitoneum in Treatment of Bronchial Asthma. In Treatment of Bronchiectasis. In Treatment of Pulmonary Emphysema. Treatment of Pulmonary Hemorrhage of Nontuberculous Origin.

THE C. V. MOSBY COMPANY SMJ 7/46
3207 Washington Boulevard
St. Louis 3, Missouri

Gentlemen: Send me immediately a copy of Banyai's new book

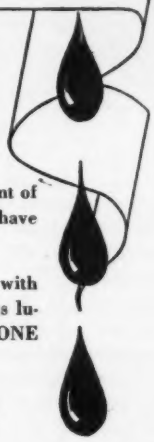
THE PNEUMOPERITONEUM TREATMENT

——Attached is my check for $6.50 ——Charge my account.

Dr._____

Address_____

For the most common emergency of pregnancy



Threatened abortion brooks no temporizing, but demands immediate and active treatment. The outmoded "wait and watch" policy has given way to prompt injection of PROLUTON, pure crystalline progesterone, for as long as pain and spotting persist. As a result, approximately eighty per cent of pregnancies threatened with destruction have been saved.[1,2]

After the emergency has been controlled with PROLUTON, the continued need for corpus luteum hormone may be met with PRANONE Tablets, the orally effective progestin.

PROLUTON
PRANONE

PROLUTON—pure crystalline progesterone in oil in ampules of 1, 2, 5 and 10 mg., in boxes of 3, 6 and 50.

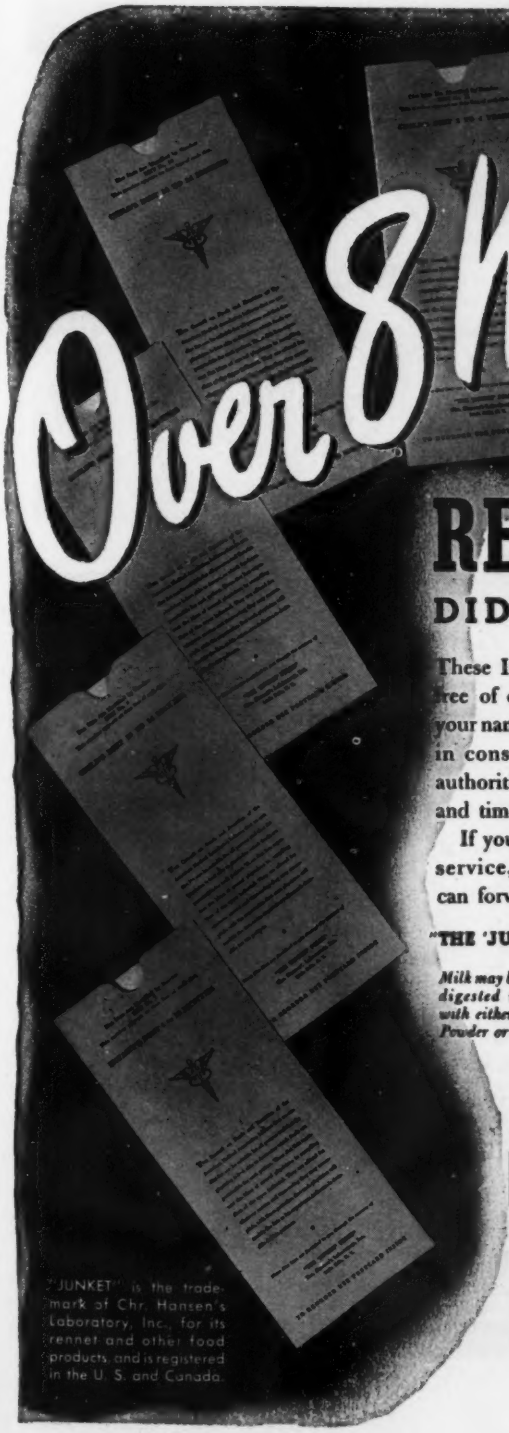
PRANONE—anhydrohydroxy-progesterone tablets of 5 and 10 mg., in boxes of 20, 40, 100 and 250.

(1) Soule, S. D.: Am. J. Obst. & Gynec. **42**:1009, 1941. (2) Mason, L. W.: Am. J. Obst. & Gynec. **44**:630, 1942.

Trade-Marks PROLUTON and PRANONE—Reg. U. S. Pat. Off.

SCHERING

Schering CORPORATION • BLOOMFIELD, NEW JERSEY
IN CANADA, SCHERING CORPORATION LIMITED, MONTREAL



Over 8 Million REQUESTED!

DID YOU GET YOURS?

These Infants' and Children's Diet Lists are sent free of charge or obligation—"personalized" with your name, address and telephone number. Prepared in consultation with pediatric and nutritional authorities, they're reliable, comprehensive, flexible and time-saving—highly welcomed by physicians.

If you're not familiar with this complimentary service, why not fill out the coupon so we can forward actual samples for your examination?

"THE 'JUNKET' FOLKS", LITTLE FALLS, NEW YORK

Milk may be made into easily digested rennet-custards with either "Junket" Rennet Powder or Tablets.

"JUNKET" is the trademark of Chr. Hansen's Laboratory, Inc., for its rennet and other food products, and is registered in the U. S. and Canada.

MAIL THIS COUPON TODAY!

"THE 'JUNKET' FOLKS"
Chr. Hansen's Laboratory, Inc., Little Falls, N. Y.

Please send me samples of your infants' and children's diet lists. Also trial packages of "Junket" Rennet Powder and Tablets. 76-L

*Name*_____
Please Print

*Address*_____

*City*_____ *State*_____

The well nourished baby is more resistant to the common ills of infancy. Moreover it is during that all-important first year of life that the very foundation of *future* health and ruggedness is laid. Similac-fed infants are notably well nourished; for Similac provides breast milk proportions of fat, protein, carbohydrate and minerals, in forms that are physically and metabolically suited to the infant's requirements. Similac dependably nourishes the bottle fed infant — *from birth until weaning.*

ACCEPTED AMERICAN MEDICAL ASSN.

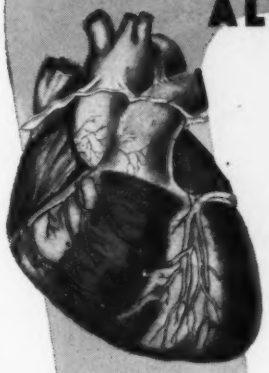
A powdered, modified milk product especially prepared for infant feeding, made from tuberculin tested cow's milk (casein modified) from which part of the butter fat is removed and to which has been added lactose, olive oil, cocoanut oil, corn oil and fish liver oil concentrate.

SIMILAC } SIMILAR TO HUMAN MILK

M&R DIETETIC LABORATORIES, INC. • COLUMBUS 16, OHIO

In Daily Maintenance, too...

ALL THESE ADVANTAGES



MAINTENANCE of sustained, unvarying, digitalization of the failing myocardium can be accomplished only through the use of cardiotonic drugs of uniform potency and dependable therapeutic action. Differences in potency make for varying clinical results which, in the case of cardiac disease, may prove extremely distressing to both patient and physician.

With Digitaline Nativelle—pure crystalline digitoxin—such uncertainty is circumvented. Representing the chief cardiotonic glycoside of Digitalis purpurea, Digitaline Nativelle is so constant in potency and pharmacologic action that dosage can be and is measured by weight. One tablet of 0.1 mg. represents the therapeutic equivalent of 1.5 gr. of standardized whole digitalis leaf, a ratio which reflects its high state of purity.[1]

Dependable maintenance digitalization is effected by 0.1 mg. daily; only rarely must this quantity be raised to 0.2 mg. daily. Thus no different instructions need be given the patient. Because it is absorbed in toto, probably from the stomach, Digitaline Nativelle virtually never produces nausea or vomiting from local irritation.[2]

If desired, rapid, *complete*, digitalization may be produced in 6 to 10 hours by the *oral* administration of 1.2 mg. of Digitaline Nativelle,[3] given either at one time or in 2 doses of 0.6 mg. each at a 3- to 6-hour interval.

WHEN THE INTRAVENOUS ROUTE IS DESIRED

Digitaline Nativelle is available in ampuls of 0.2 mg. (1 cc.) and 0.4 mg. (2 cc.), in packages of 6 ampuls. Intravenous dosage identical with oral dosage for initial digitalization.

1 Gold, H.; Cattell, M.; Modell, W.; Kwit, N. T.; Kramer, M. L., and Zahm, W.: J.Pharmacol. & Exper.Therap. 82:187 (Oct.) 1944.
2 Gold, H.: Connecticut M.J. 9:3 (Mar.) 1945.
3 Levine, S. A.: Clinical Heart Disease, ed. 3, Philadelphia, 1945, W. B. Saunders, p. 273.

Physicians are invited to send for samples, literature, and bibliography.

ACCEPTED AMERICAN MEDICAL ASSN. **COUNCIL ACCEPTED**

VARICK PHARMACAL COMPANY, INC.
A Division of E. Fougera & Co., Inc.
75 Varick Street, New York 13, New York

Digitaline Nativelle

REG. U. S. PAT. OFF.

THE ORIGINAL DIGITOXIN IN PURE, CRYSTALLINE FORM

When they run to you for relief...

Hay fever's moist and swollen discomforts respond promptly to Neo-Synephrine... the familiar ¼ per cent for nasal decongestion... the ⅛ per cent ophthalmic for excessive lacrimation, itching, burning and palpebral edema. Repeated doses are uniformly effective and virtually free of rebound congestion.

Neo-Synephrine

HYDROCHLORIDE

Brand of Phenylephrine [Levo • d • Hydroxy • β • Methylamino • 3 • Hydroxy • Ethylbenzene] Hydrochloride

For Hay Fever Relief

THERAPEUTIC APPRAISAL: Quick-acting, long-lasting... nasal decongestion without appreciable compensatory recongestion; virtual freedom from local and systemic side effects; sustained effectiveness upon repeated use; isotonic to avoid irritation.

INDICATED for relief of nasal and ophthalmic discomfort in allergic rhinitis, sinusitis, and the common cold.

ADMINISTRATION: By dropper, spray or tampon for intranasal use; by dropper ...2 or 3 drops... in the eye.

SUPPLIED: *For Intranasal Use*—¼% in saline or in Ringer's with aromatics; 1% in saline, bottles of 1 fl. oz. ½% jelly in convenient applicator tubes.

For Ophthalmic Use—⅛% in a special low-surface-tension aqueous vehicle*, bottles of 15 cc.

Trial Supplies Upon Request

Frederick Stearns & Company

Division

DETROIT 31, MICHIGAN

NEW YORK KANSAS CITY SAN FRANCISCO WINDSOR, ONTARIO SYDNEY, AUSTRALIA AUCKLAND, NEW ZEALAND

*Contains Aerosol OT 100 (dioctyl ester of sodium sulfosuccinate) 0.001%.

Trade-Mark Neo-Synephrine Reg. U. S. Pat. Off.

A SAFE *Summer* PRESCRIPTION FOR INFANT NUTRITION

Even under the handicaps of travel or vacation accommodations, a mother can easily prepare a *safe* formula for her infant . . . by just adding cooled boiled water to Biolac according to the physician's directions. The simplicity of preparation (dilution only) minimizes possibilities of formula contamination even under adverse conditions.

In addition to safety and simplicity of preparation, Biolac formulas provide complete nutrition when supplemented with vitamin C. No chance omission of needed vitamins, carbohydrates or iron can occur. Biolac simply and safely affords nutritional elements for optimum health.

Easily calculated . . . quickly prepared. 1 fl. oz. Biolac to 1½ fl. oz. water per pound of body weight.

BORDEN'S PRESCRIPTION PRODUCTS DIVISION
350 MADISON AVENUE • • NEW YORK 17, N. Y.

Biolac

"BABY TALK" FOR A GOOD SQUARE MEAL

Biolac is a liquid modified milk, prepared from whole and skim milk, with added lactose, and fortified with vitamin B_1, concentrate of vitamins A and D from cod liver oil, and iron citrate. Evaporated, homogenized, and sterilized. Biolac is available in 13 fl. oz. cans at all drug stores.

PICNIC PLAGUE

6 AND 12 FL. OZ.
BOTTLES

DIARRHEA DUE TO FOOD CONTAMINATION, excessive heat, vacation indulgences or change of drinking water is quickly controlled by Kaomagma.

AT THE ONSET give 2 tablespoonfuls in a little water . . .

. . . FOLLOWED BY one tablespoonful after every bowel movement.

FOR PROMPT RELIEF FROM DIARRHEA

KAOMAGMA
REG. U. S. PAT. OFF.

Kaolin in Alumina Gel

Wyeth
REG. U. S. PAT. OFF.

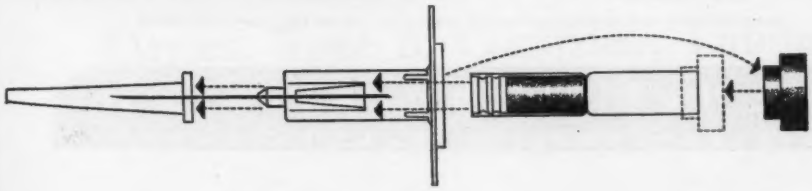
CLEANSES • COATS • PROTECTS • SOOTHES

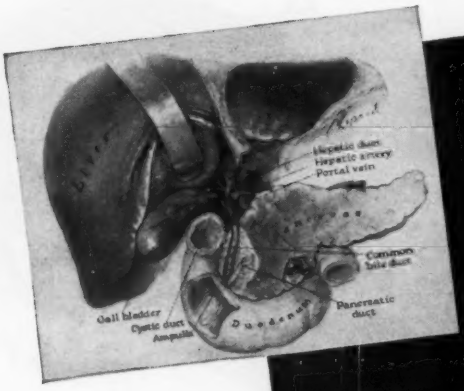
WYETH INCORPORATED • PHILADELPHIA 3 • PA.

as easy as.....

● Well, *almost*. That describes the preparation for an injection of the Romansky formula of penicillin calcium in oil and wax when the new Abbott Sterile Disposable Syringe Set is used. No further sterilization of syringe and needle. No drying. No complication caused by traces of water remaining in them. Eliminates the difficulty of drawing the heavy fluid into the syringe. Does away with the waste of suspension which cannot be withdrawn from the inside surfaces of a bulk container. Always a new, sharp, properly gauged needle. And, best of all perhaps, *there's no bothersome cleaning of needles or syringe afterward*. Just throw away. ● Set consists of a sterile syringe with an affixed 20-gauge, 1½-inch sterile, stainless steel needle, and a glass cartridge-plunger containing a 1-cc. dose of 300,000 units. ● Sorry that supply doesn't always meet demand, but we're producing larger quantities every day. ABBOTT LABORATORIES, NORTH CHICAGO, ILLINOIS.

Abbott's Disposable Syringe Set with *Penicillin* in Oil and Wax
(ROMANSKY FORMULA)





SUPPORTING THERAPY in LIVER DAMAGE

In many stubborn cases, support in impaired liver function and hepatic damage is safely attained through the use of

SORPARIN

(Ext. Sorbus aucuparia 'McNeil')

Conspicuous among the outstanding actions of this recently re-investigated botanical are:

- **Sorparin stimulates the functioning of liver cells.**
- **In a large majority of cases Sorparin dispels the indefinite dyspepsias frequently associated with hepato-biliary dysfunction.**
- **Is not a cholagogue nor a choleretic—may be used in obstructive types of jaundice.**
- **No known contraindications.**
- **May be used with safety in combination with bile salts (although these are not required for therapeutic efficacy) with vitamin K, antispasmodics, sedatives or sulfonamides without incompatibility.**

CLINICAL INDICATIONS: Hepatitis, with or without jaundice, indeterminate dyspepsias, post-surgical biliary syndrome and idiopathic hypoprothrombinemia. Also useful for mild liver dysfunction secondary to such conditions as chronic cholecystitis, etc.

Available in tablets, each containing 3 gr. Sorparin. Bottles of 100, 500 and 1000. Literature on request.

McNeil Laboratories
INCORPORATED
PHILADELPHIA • PENNSYLVANIA

Indicated therapy in Sequelae of

Epidemic Encephalitis

Pills Stramonium *(Davies, Rose)*

2½ grains

Physicians in private practice as well as in neurological clinics have widely prescribed these pills since 1929, and their continued interest in and use of them point to the serviceability of this therapy.

Stramonium Pills (Davies, Rose) exhibit in each pill 2½ grains of alkaloidally standardized Stramonium (powdered dried leaf and flowering top of Datura Stramonium, U. S. P.), equivalent to 25 minims (1.54 c. c.) of Tincture U. S. P.

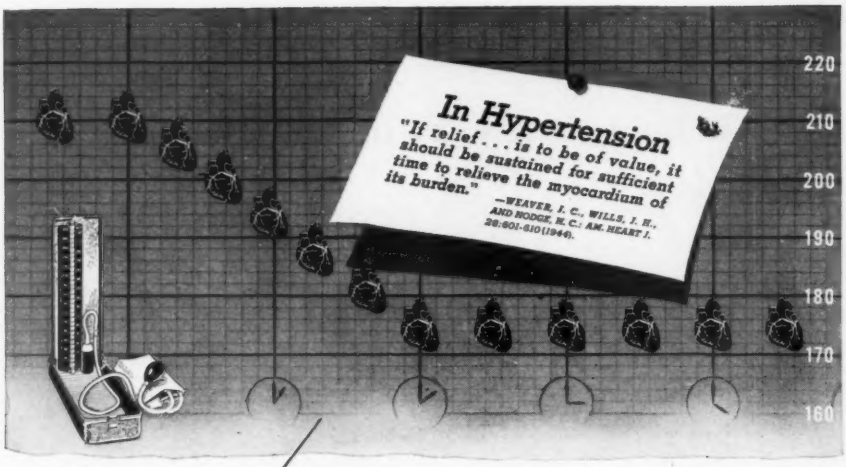
As a reassurance of the activity of the finished pills, they, too, are alkaloidally assayed, thus establishing as far as possible uniformity and dependability.

A package for clinical trial and literature mailed free of charge upon request.

Davies, Rose & Company, Limited

Manufacturing Chemists Boston 18, Massachusetts

St-1


In Hypertension
"If relief . . . is to be of value, it should be sustained for sufficient time to relieve the myocardium of its burden."
—WEAVER, J. C., WILLS, J. H., AND HODGE, H. C.: AM. HEART J. 28:601-610 (1944).
220
210
200
190
180
170
160

Maintaining lowered blood pressure over a more prolonged period...

NITRANITOL

BRAND OF MANNITOL HEXANITRATE

By its gradual, prolonged hypotensive action, Nitranitol relieves the myocardium of its burden, greatly lessens the danger of arterial damage and permits a resumption of regular activities.

There is no precipitate fall in blood pressure with Nitranitol, and its action is so prolonged as to permit maintenance of a continuous reduced pressure. Nitranitol can be used over extended periods of time without toxic manifestations; it does not produce nausea, and headache is rare.

Indications: Nitranitol is indicated in idiopathic arterial hypertension, for relief of such symptoms as headache, vertigo, palpitation, dyspnea, numbness, arrhythmia, etc., and for prevention of angina pectoris attacks, especially in patients suffering nocturnal seizures.

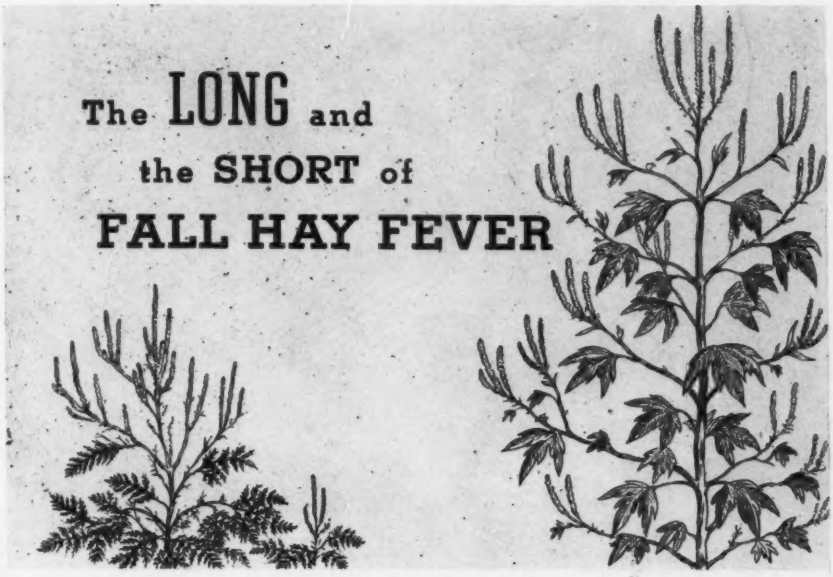
Average Dosage: One to two tablets every 4 to 6 hours. Nitranitol is available at prescription pharmacies in bottles of 100 and 1000 tablets. Each scored tablet contains ½ gr. mannitol hexanitrate.

Nitranitol with Phenobarbital For cases requiring sedation in addition to vasodilation, ½ gr. Nitranitol is combined with ¼ gr. phenobarbital. Supplied in bottles of 100 and 1000.

Trademark "Nitranitol" Reg. U. S. Pat. Off.

MERRELL

THE WM. S. MERRELL COMPANY · CINCINNATI, U. S. A.



By far the commonest cause of the autumnal variety of hay fever is the pollen of either or both giant and short ragweed. To meet the needs of some 98% of all fall hay fever sufferers, Pitman-Moore Company offers:

ALLERGENIC EXTRACT RAGWEED POLLENS

(Mixed)

For Individualized Treatment

★ ***PITMAN-MOORE*** Ragweed Pollen Extract is presented in a specially designed individual treatment package, which permits the dosage to be adjusted to individual sensitivity, a method definitely better than giving every patient the same dosage. The stability of this allergen is intensified by the use, in its production, of a special glycero-saline menstruum which insures full potency beyond the expiration date.

● ***PROPHYLAXIS***—Injections may be started 3 weeks or more before expected first symptoms.

● ***CO-SEASONAL TREATMENT***—Applicable following or in lieu of pre-seasonal prophylaxis.

For more detailed information as to advantages, dosage, etc., write for literature.

ACCEPTED AMERICAN MEDICAL ASSN.

PITMAN-MOORE COMPANY

PHARMACEUTICAL AND BIOLOGICAL CHEMISTS

Division of Allied Laboratories, Inc., · Indianapolis 6, Indiana

Three drops of PRIVINE... and welcome relief!

Hay fever sufferers are finding prolonged symptomatic relief with minimal dosage—only three drops—of Privine, Ciba's potent vasoconstrictor.

Privine Hydrochloride acts quickly on the nasal mucosa without retarding ciliary activity. The solution is buffered to a pH of 6.2, closely simulating normal nasal secretions.

Physicians will find that by advising their patients to use no more than the recommended three drops in each nostril, no oftener than three times daily, gratifying and prolonged relief will be experienced.

PRIVINE is available in two solutions, 0.1 per cent and 0.05 per cent, packaged in 1-ounce bottle with dropper designed to dispense but three drops—the recommended dose. Also available in bottles of 16 fluid ounces.

PRIVINE NASAL JELLY—Tubes of ⅓ oz., containing 0.05% Privine Hydrochloride.

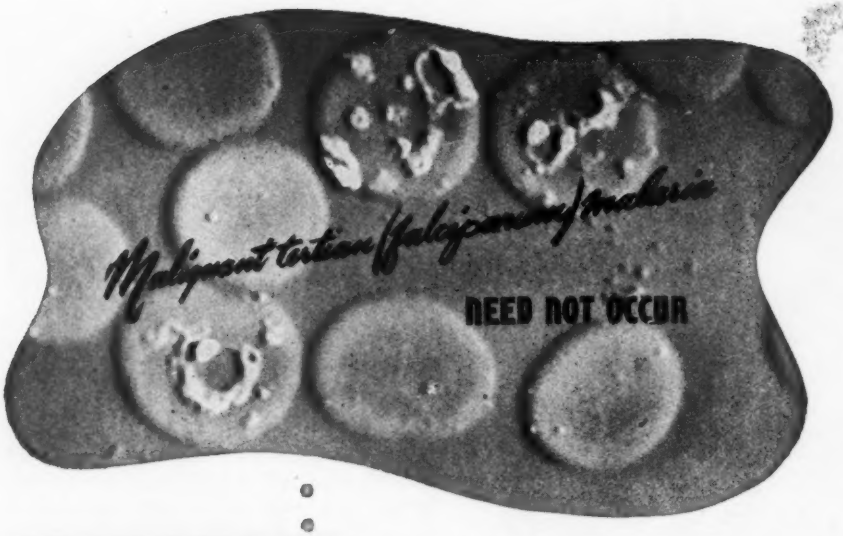
Privine — *Trade Mark Registered in U. S. Pat. Off. Brand of Naphazolene Hydrochloride*

CIBA

Privine is Council Accepted.

CIBA PHARMACEUTICAL PRODUCTS, INC., SUMMIT, NEW JERSEY

In Canada: **Ciba Company Limited, Montreal**



ATABRINE DIHYDROCHLORIDE, the drug of choice for all types of malaria, is particularly effective in the prevention of malignant tertian (falciparum) malaria. It not only suppresses the clinical symptoms but actually cures this malignant form of malaria. The evidence of a similar curative effect of quinine is not conclusive.

Convincing evidence regarding the high relative safety of Atabrine dihydrochloride has been accumulated in the tremendous military experience of recent years. In fact, true toxicity of Atabrine dihydrochloride in man following recommended dosage over long periods of time has not been proved.

WINTHROP

ATABRINE DIHYDROCHLORIDE

"Atabrine," Trademark Reg. U. S. Pat. Off. & Canada
BRAND OF QUINACRINE HYDROCHLORIDE

SYNTHESIZED IN OUR LABORATORIES

Winthrop CHEMICAL COMPANY, INC.
Pharmaceuticals of merit for the physician • New York 13, N.Y. — Windsor, Ont.

TO STRENGTHEN THE FALTERING HEART

Capably fulfilling its original Greek meaning, "food of the gods"—theobromine, as supplied in Calpurate (in the form of calcium theobromine-calcium gluconate), is uniquely valuable in the treatment of coronary artery disease. For, besides improving alimentation of cardiac tissue through its potent myocardial-stimulating, and vasodilating actions—Calpurate (unlike so many oral xanthine preparations) adds nothing to the burden of the heart with respect to the gastro-intestinal tract. Theobromine's calcium gluconate salts, being almost insoluble in the stomach, yet readily absorbed by the intestine, have been found "least likely to cause distress".* Many cardiologists consider this a not insignificant factor in "screening" a medicament for cases involving extended therapy.

Available: In tablets of 7½ gr. of calcium theobromine-calcium gluconate, or with ¼ gr. phenobarbital, when sedation is desired—in bottles of 100, 500 or 1000. Also as powder in 1 oz. bottles.

Dosage: Adult dose is 1 or 2 tablets, or 7 to 15 gr. of powder.

*Quart. Bull. Northwestern Univ. Med. School, 16:179, 1942.

THE MALTBIE CHEMICAL COMPANY • Founded in 1888 • NEWARK, N. J.

CALPURATE

RELIEVES SYMPTOMS—YET AVOIDS G-I UPSETS

A Fundamental Approach
TO SULFUR METABOLISM

HYDROSULPHOSOL

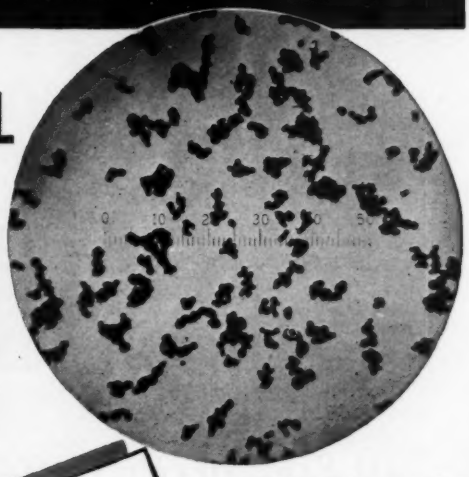


Illustration showing flowers of sulfur magnified 82X: small divisions = 10 microns. The size of the colloidal sulfur particle in Hydrosulphosol is estimated at 1/1000 of a micron or 1/10,000 of the small division particle illustrated.

A true solution of sulfur bearing compounds resulting solely from the reduction of flowers of sulfur by a catalytic process. In aqueous solution, it is capable of releasing its unusually high concentration of sulfhydryl ion in readily utilizable form . . . without evidence of toxic reaction.

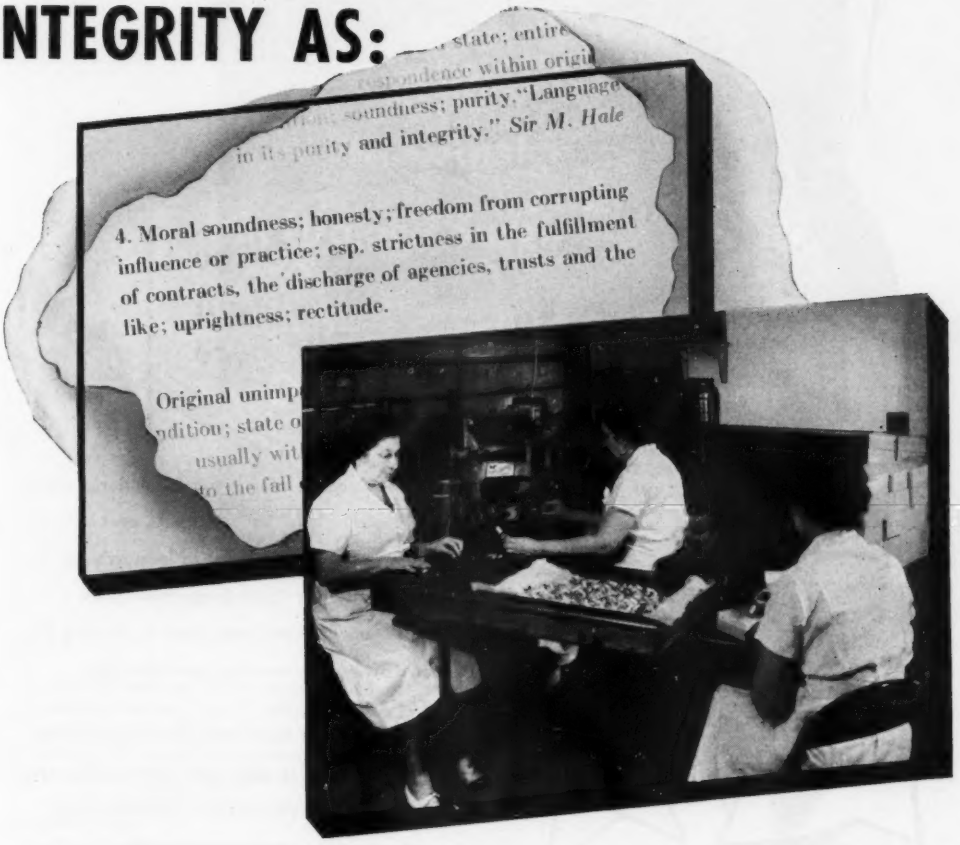
Its therapeutic importance may best be evaluated by the fact that the —SH radical of the cysteine forms the active group in glutathione, alone of reported importance in connection with tissue oxidations.

Hydrosulphosol is indicated in the management of burns, ulcers and pathological conditions in which sulfur metabolism is a clinical consideration.

Reprints of scientific papers by authoritative investigators available on request.

Rees-Davis Drugs, Inc.
MERIDEN, CONNECTICUT

WEBSTER DEFINES INTEGRITY AS:


in its purity and integrity." Sir M. Hale
4. Moral soundness; honesty; freedom from corrupting influence or practice; esp. strictness in the fulfillment of contracts, the discharge of agencies, trusts and the like; uprightness; rectitude.

U. S. STANDARD PRODUCTS

●

BIOLOGICALS

●

PHARMACEUTICALS

●

ALLERGENIC PRODUCTS

●

HORMONES

Most physicians who use U. S. Standard Products routinely—and they are many—would agree as to the singular aptness of that definition applied to U. S. Standard biologicals and pharmaceuticals.

An increasing number of physicians are looking to U. S. Standard to supply them with medicaments formulated to meet unusual as well as routine needs—and to bring them the new advances of pharmacologic progress.

This specialized service to the medical profession stems from a somewhat unusual organization. Devoted to the principle: "Not how *much*, but how well," U. S. Standard Products Co. are especially well situated in location, staff, personnel and facilities.

U. S. STANDARD PRODUCTS CO.

WOODWORTH, WISCONSIN, U. S. A.

no deception here

The false sense of security engendered upon resort to narcotic or anesthetic agents in the medical management of hemorrhoids is dangerous. For these drugs may mask more serious rectal pathology by dulling the normal sensory warning mechanisms.

With 'Anusol'* Hemorrhoidal Suppositories effective relief is obtained without deception. By means of decongestion, lubrication and protection, 'Anusol' Hemorrhoidal Suppositories bring comfort promptly, while enhancing early reversal of the varicose process . . . all without resort to narcotics or anesthetics, styptics or hemostatics.

Schering & Glatz, Inc., *a subsidiary of*

WILLIAM R. WARNER AND CO., INC., 113 WEST 18TH STREET, NEW YORK 11, N. Y.

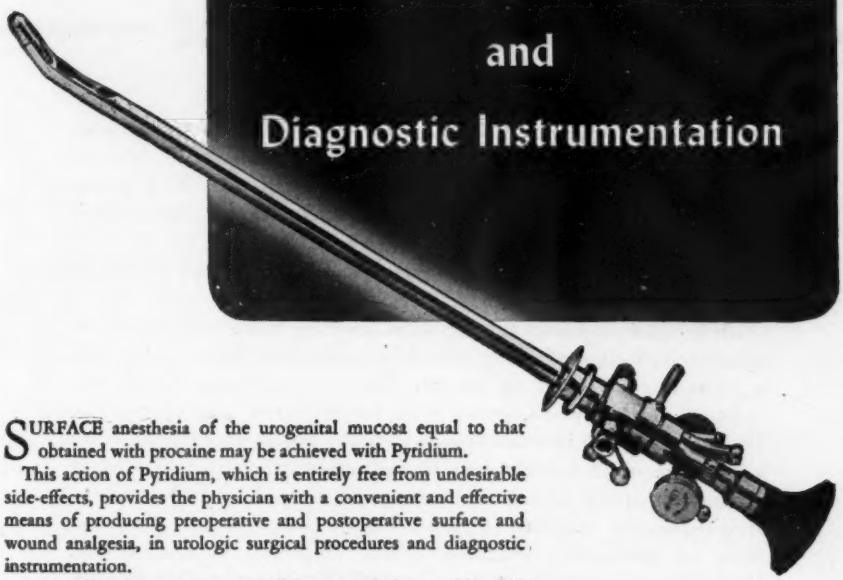
'anusol'

*Trademark Reg. U. S. Pat. Off.

Available in boxes of 6 and 12 suppositories

Hemorrhoidal Suppositories

Effective Urogenital Analgesia in Urologic Surgical Procedures and Diagnostic Instrumentation



SURFACE anesthesia of the urogenital mucosa equal to that obtained with procaine may be achieved with Pyridium.

This action of Pyridium, which is entirely free from undesirable side-effects, provides the physician with a convenient and effective means of producing preoperative and postoperative surface and wound analgesia, in urologic surgical procedures and diagnostic instrumentation.

Acting directly on the mucosa of the urogenital tract, this effect of Pyridium is entirely local. It is not associated with or due to systemic sedation or narcotic action.

The lack of toxicity characteristic of Pyridium permits its administration virtually without consideration of toxic effects.

Pyridium imparts an orange-red color to the urine. It also temporarily stains the urogenital mucosa, which may at times make it more difficult to detect inflammatory and other changes.

For cystoscopy, cystoscopic diagnostic procedures, and for urethral medication, one ounce of Pyridium Solution is injected into the urethra and bladder and held in place with the urethral clamp for a 10-minute period. The solution then is released and a repeat injection of 15 cc. is made and retained for 5 minutes.

PYRIDIUM

REG. U.S. PAT. OFF.

(Phenylazo-alpha-alpha-diamino-pyridine mono-hydrochloride)

For gratifying relief of distressing symptoms in urogenital infections.

★ *LITERATURE ON REQUEST* ★

MERCK & CO., Inc. *Manufacturing Chemists* **RAHWAY, N. J.**

WHENEVER

Impaired Fat Digestion

MUST BE OVERCOME

Impairment of fat digestion implies more than loss of available caloric food energy to the organism. It involves the failure of absorption of the fat-soluble vitamins A, D, E, and K, together with the development of deficiency manifestations. Particularly severe is vitamin K deficiency with prolongation of the prothrombin clotting time and the consequent hemorrhagic diathesis.

Whenever impaired fat digestion must be corrected, Degalol is specifically indicated. Degalol—chemically pure deoxycholic acid, a normal constituent of human bile — represents the biliary component chiefly concerned with fat digestion and absorption. Its administration in small dosage virtually normalizes fat digestion within the small bowel when lipase is not deficient, and with it absorption of the fat-soluble vitamins D, E, and K, and carotene. It is especially valuable in correcting the hemorrhagic complications of obstructive jaundice, where choleresis is undesirable. Degalol proves useful whenever impaired fat digestion is suspected, and particularly in the treatment of postprandial epigastric distress and fat intolerance not associated with chronic gallbladder disease. Supplied in tablets of 1½ gr., boxes of 100 and 500.

Degalol

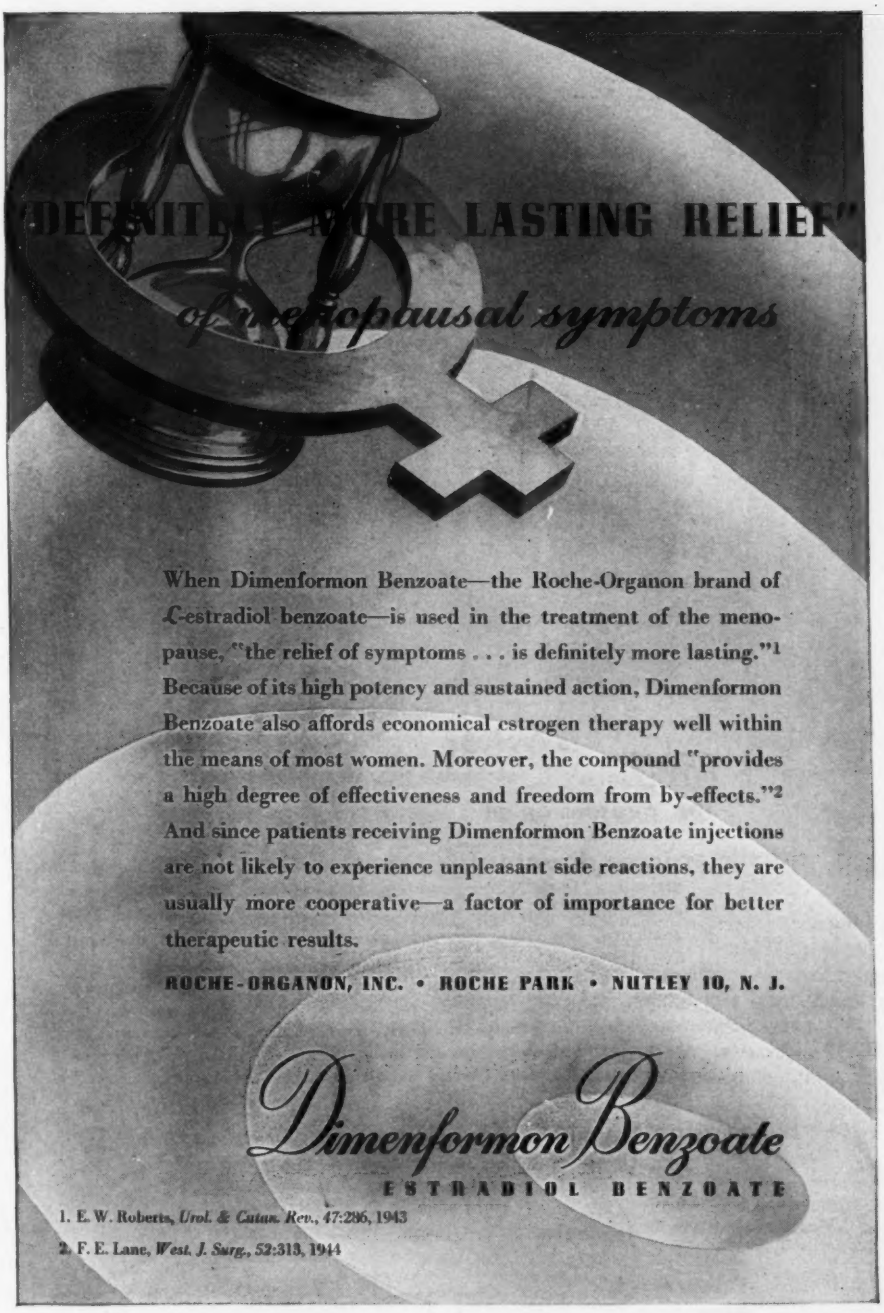
REG. U. S. PAT. OFF.

CHEMICALLY PURE DEOXYCHOLIC ACID

Riedel-de Haen

DIVISION OF AMES COMPANY, INC.

NEW YORK 13, N. Y.



When Dimenformon Benzoate—the Roche-Organon brand of *d*-estradiol benzoate—is used in the treatment of the menopause, "the relief of symptoms . . . is definitely more lasting."[1] Because of its high potency and sustained action, Dimenformon Benzoate also affords economical estrogen therapy well within the means of most women. Moreover, the compound "provides a high degree of effectiveness and freedom from by-effects."[2] And since patients receiving Dimenformon Benzoate injections are not likely to experience unpleasant side reactions, they are usually more cooperative—a factor of importance for better therapeutic results.

ROCHE-ORGANON, INC. • ROCHE PARK • NUTLEY 10, N. J.

Dimenformon Benzoate

ESTRADIOL BENZOATE

1. E. W. Roberts, *Urol. & Cutan. Rev.*, 47:286, 1943
2. F. E. Lane, *West. J. Surg.*, 52:313, 1944

to combat

the depression of

chronic organic disease Many patients with chronic organic disease—arthritis or asthma, for example—sink into a persistent depression characterized by discouragement, or even despair. Unless effectively combated, this depression may handicap management of the basic disorder and intensify its symptoms.

By restoring optimism and interest in useful living, Benzedrine Sulfate frequently helps to overcome prolonged depression accompanying chronic illness. Obviously, in such cases, careful observation of the patient is desirable; and the physician will distinguish between the casual case of low spirits and a true mental depression.

benzedrine sulfate (*racemic amphetamine sulfate, S.K.F.*) Tablets and Elixir

Smith, Kline & French Laboratories, *Philadelphia, Pa.*

Frequently missed . . . BUT STILL THERE

"The diagnosis of deficiency disease," states Jolliffe, "is frequently missed because it is not looked for."*

But once recognized, the sick patient with mixed vitamin deficiencies must be treated with the essential vitamins in doses of therapeutic magnitude. No simple multiplication of maintenance multi-vitamin preparations is practical — for there is no fixed ratio between the doses for therapy and those for maintenance.

For doses of true therapeutic magnitude prescribe SQUIBB THERAPEUTIC FORMULA. A single capsule contains these massive doses:

Vitamin A	25,000 units	5 times	maintenance level recommended by the Food and Nutrition Board of the National Research Council
Vitamin D	1,000 units	1¼ times	
Thiamine HCl	5 mg.	2½ times	
Riboflavin	5 mg.	2 times	
Niacinamide	150 mg.	7½ times	
Ascorbic Acid	150 mg.	2 times	

SQUIBB *Therapeutic Formula*
VITAMIN CAPSULES

*Jolliffe, N.: J.A.M.A. **129**:613 (Oct. 27) 1945.

MANUFACTURING CHEMISTS TO THE MEDICAL PROFESSION SINCE 1858

Nutritional adequacy is a fundamental requisite for normal convalescence. LIVER AND YEAST EXTRACT *ARMOUR* is an excellent nutritional adjuvant, not only because of the nutritional factors it contains, but also because of its tonic effect and stimulating action on the appetite. It hastens convalescence and helps overcome lassitude, fatigue and malaise. Furunculosis and inflammatory or ulcerative lesions of the mucous membrane may yield also to Liver and Yeast therapy.

LIVER AND YEAST EXTRACT *ARMOUR* is absorbed rapidly and its physiologic stimulating effect is noted promptly. In this preparation, the yeast has been washed free from gastrointestinal irritating properties. The hydrolyzing and stabilizing processes are so conducted that the often objectionable liver odor and taste are eliminated while the primary and secondary anti-anemic factors as well as the vitamin B complex of both liver and yeast are preserved. It is quite palatable.

LIVER AND YEAST EXTRACT *ARMOUR* is supplied in 8 ounce bottles. The adult dose is two teaspoonfuls twice daily. Larger doses, if indicated, may be given safely. It is best administered in a little milk, water, or fruit juice. When there is a decided tendency toward secondary anemia it may be given in conjunction with some form of iron.

℞ Liver and Yeast Extract Armour

Have confidence in the preparation you prescribe – specify ARMOUR.

The ARMOUR Laboratories
CHICAGO 9, ILLINOIS
Headquarters for Medicinals of Animal Origin

MANDELAMINE

Reg. U. S. Pat. Off.
(Methenamine Mandelate)

IS AN ESPECIALLY EFFECTIVE URINARY ANTISEPTIC

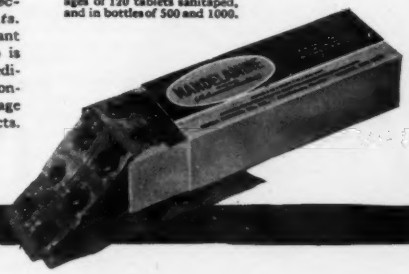
Safety, ease of administration, and characteristically prompt action combine to make Mandelamine an especially efficient agent in the treatment of urinary infections in children and in elderly patients.

Freedom from drug toxicity is an important consideration to the busy physician who is unable to maintain patients under close medical supervision. Mandelamine may be confidently prescribed in therapeutic dosage virtually without consideration of toxic effects.

Uncomplicated oral administration of Mandelamine requires no supplementary acidification, restriction of fluid intake, dietary control, or other special measures. Only in those infections due to urea-splitting organisms, may accessory acidification be necessary.

Early control of common urinary infections is the characteristic response to Mandelamine therapy. Disturbing urinary symptoms are usually alleviated rapidly and, in the absence of obstruction, the urine is promptly cleared of organisms in a high percentage of cases.

Mandelamine is supplied in enteric coated tablets of 0.25 Gm. (3¾ grains) each, in packages of 120 tablets sanitaped, and in bottles of 500 and 1000.



NEPERA CHEMICAL CO. INC.
21 Gray Oaks Ave.
Yonkers 2, New York
Please send me literature, and a physician's sample of Mandelamine.

Name.....M.D.

Street.....

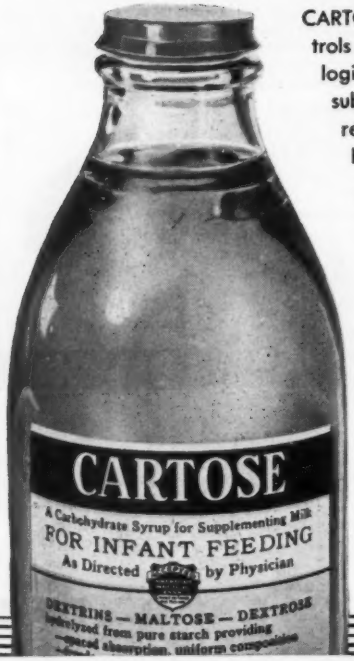
City.....State.....

NEPERA CHEMICAL CO. INC.

Manufacturing Chemists Yonkers 2, New York

CARTOSE* is prepared especially for use in modifying milk for feeding infants. It provides definite proportions of nonfermentable high dextrins, maltose and dextrose.

CARTOSE permits flexibility in formula writing which is desired by physicians. Its mixed carbohydrates favor the spaced absorption held to be advantageous in infant nutrition.



CARTOSE is manufactured under process controls which assure a high standard of bacteriological purity and freedom from foreign substances. It is packed in a container which reduces the possibility of contamination after the bottle has been opened.

Gastrointestinal disturbances are minimized when CARTOSE is used as a milk modifier.

CARTOSE

Reg. U. S. Pat. Off.

MIXED CARBOHYDRATES

Two tablespoonfuls (approximately one ounce) of CARTOSE provide 120 calories.

Supplied in clear glass bottles containing one pint.

Available through all pharmacies.

Samples and literature will be sent to physicians upon request.

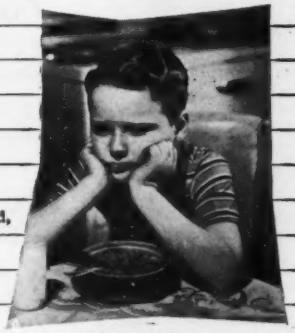
H. W. KINNEY & SONS, INC.
COLUMBUS • INDIANA
(Formerly Scientific Sugars Company)

Kinney

* registered trademark of H. W. Kinney & Sons, Inc.

Commonest pediatric problem:

"My child won't eat"



Even though a child may be undernourished, his appetite often fails. To combat anorexia caused by a lack of important B vitamins, pediatricians increasingly prescribe 'Ryzamin-B' No. 2. Containing the natural B complex as a concentrate of oryza sativa (American rice) polishings, 'Ryzamin-B' No. 2 also supplies potent synthetic B factors. Children enjoy this rich, honey-like, tasty B complex preparation taken directly from the special measuring spoon, as a delicious spread when mixed with jam or peanut butter, or dissolved in milk, fruit juices, favorite beverages. The doctor often solves his commonest pediatric problem with 'Ryzamin-B' No. 2.

Tubes of 2 oz. and bottles of 8 oz. Each gram contains: Vitamin B_1 (Thiamine Hydrochloride) 1 mgm. (333 U.S.P Units); Vitamin B_2 (Riboflavin) 0.67 mgm; Nicotinamide 6.7 mgm. and other factors of the B complex. Gram measuring spoon with each packing.

'RYZAMIN-B' BRAND RICE POLISHINGS CONCENTRATE **No. 2**

WITH ADDED THIAMINE HYDROCHLORIDE, RIBOFLAVIN, NICOTINAMIDE

'Ryzamin-B' reg. trademark

BURROUGHS WELLCOME & CO. (U.S.A.) INC., 9 & 11 EAST 41ST ST., NEW YORK 17, N. Y.

To lessen renal complications during administration of sulfonamides *Combisul-TD*

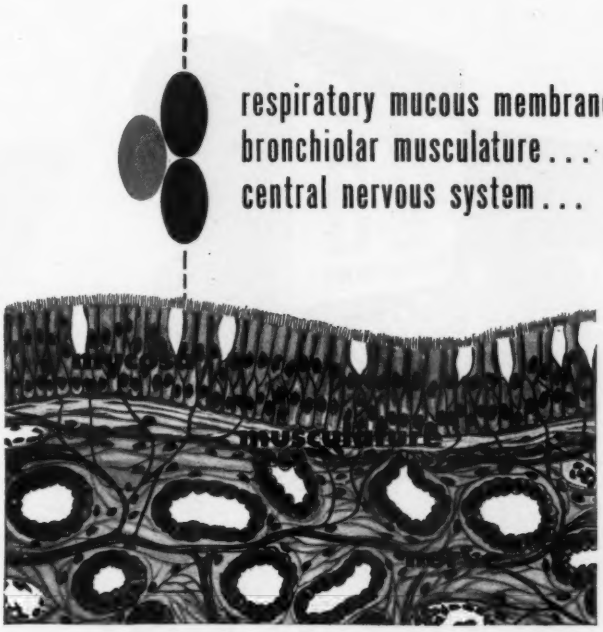
Combisul-TD is a combination of sulfaTHIAZOLE and sulfaDIAZINE in equal parts in one tablet. Administration of these two sulfonamides together reduces the likelihood of renal involvement even though the total quantity of sulfa drugs is the same as when either is used alone.[1,2] Danger of calculus formation with oliguria and anuria is largely eliminated by *Combisul-TD*, for even crystalluria is uncommon. The chemotherapeutic activity of *Combisul-TD* is equivalent to that obtained when either constituent is used in full dosage.

Combisul-TD available in 0.5 Gm. tablets each containing 0.25 Gm. sulfathiazole and 0.25 Gm. sulfadiazine. Indications and dosage are the same as for either drug administered alone.
For the treatment of meningitis, *Combisul-DM* consisting of 0.25 Gm. sulfadiazine and 0.25 Gm. sulfamerazine is available.
Combisul-TD available in 0.5 Gm. tablets. Bottles of 100 and 1000.
Combisul-DM available in 0.5 Gm. tablets. Bottles of 100 and 1000.

1. Lehr, D.: Proc. Soc. Exper. Biol. & Med. **58**:11, 1945.
2. Lehr, D.: In press.

Trade-Marks *Combisul-TD* and *Combisul-DM*—Reg. U.S. Pat. Off.

Schering CORPORATION • BLOOMFIELD • N. J.
In Canada, Schering Corporation Limited, Montreal



respiratory mucous membrane...
bronchiolar musculature...
central nervous system...

All three are involved in the pathologic physiology of allergic manifestations of the respiratory tree.

Each structure can be successfully and simultaneously treated with

Amodrine

SEARLE

This rational compound provides an inclusive, effective management of hay fever and asthma by its combination of . . . . .

Aminophyllin-Searle 100 mg.—1½ gr.

Racephedrine-Hydrochloride 25 mg.—⅜ gr.

Phenobarbital 8 mg.—⅛ gr.

Amodrine is the registered trademark of G. D. SEARLE & CO., Chicago 80, Illinois

SEARLE

RESEARCH IN THE SERVICE OF MEDICINE

- - - IN PREGNANCY, LACTATION, INFANCY, CHILDHOOD, CONVALESCENCE - - -

made convenient and pleasant when prescribed in the form of—

Calcium Gluconate Effervescent

(Flint)

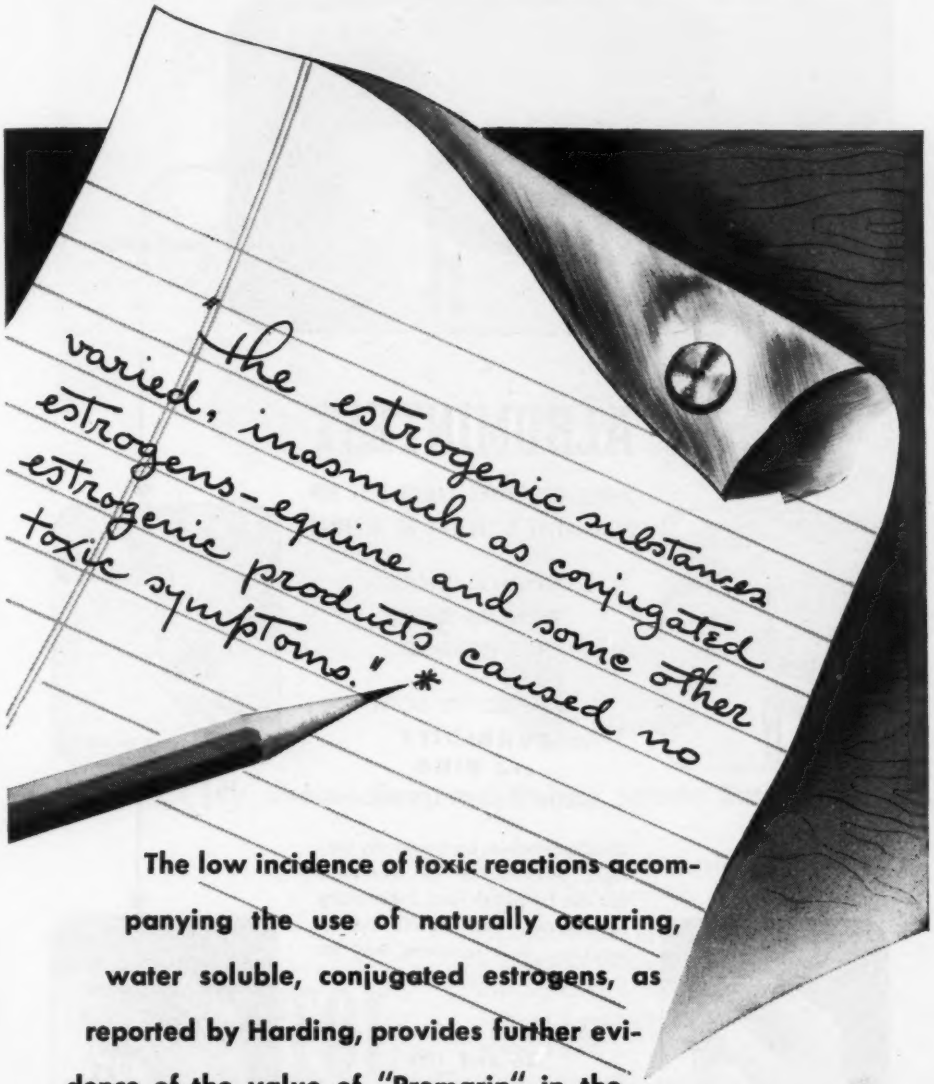
Added to water, Calcium Gluconate Effervescent (Flint) forms a sparkling, effervescent solution, which is pleasantly palatable—a factor very important when calcium is prescribed over an extended period.

Protected by U. S. Patent No. 1983954—each gram contains calcium gluconate U.S.P. 0.5 Gm., citric acid 0.25 Gm., and sodium bicarbonate 0.25 Gm.

The average dose is 1 to 1½ teaspoonfuls. Calcium Gluconate Effervescent (Flint) contains 48 to 52 per cent calcium gluconate.

FLINT, EATON & COMPANY

DECATUR • ILLINOIS



The low incidence of toxic reactions accompanying the use of naturally occurring, water soluble, conjugated estrogens, as reported by Harding, provides further evidence of the value of "Premarin" in the management of the menopausal syndrome.

*Harding, F. E.: Am. J. Obst. & Gynec., 51:940 (May) 1946

"Premarin"

REG. U. S. PAT. OFF.

Ayerst

AMERICAN MEDICAL ASSN.

CONJUGATED ESTROGENS (equine)

Tablets of 1.25 mg. Tablets of 0.625 mg. Liquid, containing 0.625 mg. per teaspoonful

AYERST, McKENNA & HARRISON LIMITED • 22 E. 40TH STREET • NEW YORK 16, N. Y.

TURBIDITY METHOD
(1) Drop one tablet in 4 cc. water.

RING METHOD
(1) drop one tablet in 4 cc. water.

ALBUMINTEST

SIMPLE, CONVENIENT TABLET TEST FOR QUALITATIVE DETECTION OF ALBUMIN

•

NONPOISONOUS
NONCORROSIVE
NO HEATING

•

ADAPTED TO BOTH
TURBIDITY
and RING
METHODS OF TESTING.

Quick, reliable, conveniently carried, Albumintest is designed for use by physicians, laboratory technicians and public health workers. Bulk solutions may be made up in any quantity.

•

Economical in bottles of 36 and 100

•

ORDER FROM YOUR DEALER

•

A Companion to Clinitest — Tablet Method for Urine-Sugar Analysis

(2) drop in 1 cc. urine.

(2) float in 1 cc. urine.

(3) degree of turbidity indicates presence of albumin.

(3) ring density indicates presence of albumin.

AMES COMPANY, Inc., Elkhart, Indiana

A new treatment for

Poison Ivy, Poison Oak, and Poison Sumac Dermatitis

THYPTOL

REG. U. S. PAT. OFF.

KAOLIN IN ALUMINA GEL WITH PHENOL

THYPTOL CHECKS symptoms *at once* . . . The skin heals quickly.

Prevents spread of the lesions. The base of kaolin and alumina gel inactivates the irritant fluid in the blisters and dries to form a protective coating which prevents spread.

Controls itching promptly through the local anesthetic action of phenol.

Thyptol is available in 3 oz. bottles. Apply locally.

Wyeth
REG. U.S. PAT. OFF.

WYETH INCORPORATED • PHILADELPHIA 3, PA.

ALL THE NUTRIENTS

Essential for a Food Supplement

Whenever the intake of essential nutrients must be augmented, as in convalescence from surgery or infectious disease, or in the correction of malnutrition, the delicious food drink which results from mixing Ovaltine with milk can be of significant value. This palatable food supplement provides a wealth of essential nutrients in a pleasant, easily assimilated form. It supplies protein of high biologic value, readily metabolized carbohydrate, easily emulsified fat, ascorbic acid, B complex and other vitamins, as well as essential minerals. Three glassfuls daily sharply augments the intake of these nutrients, as shown by the table of composition. Its low curd tension makes for rapid gastric emptying, hence appetite for the next meal is not interferred with. This delicious food drink is enjoyed both as a mealtime beverage and between meals.

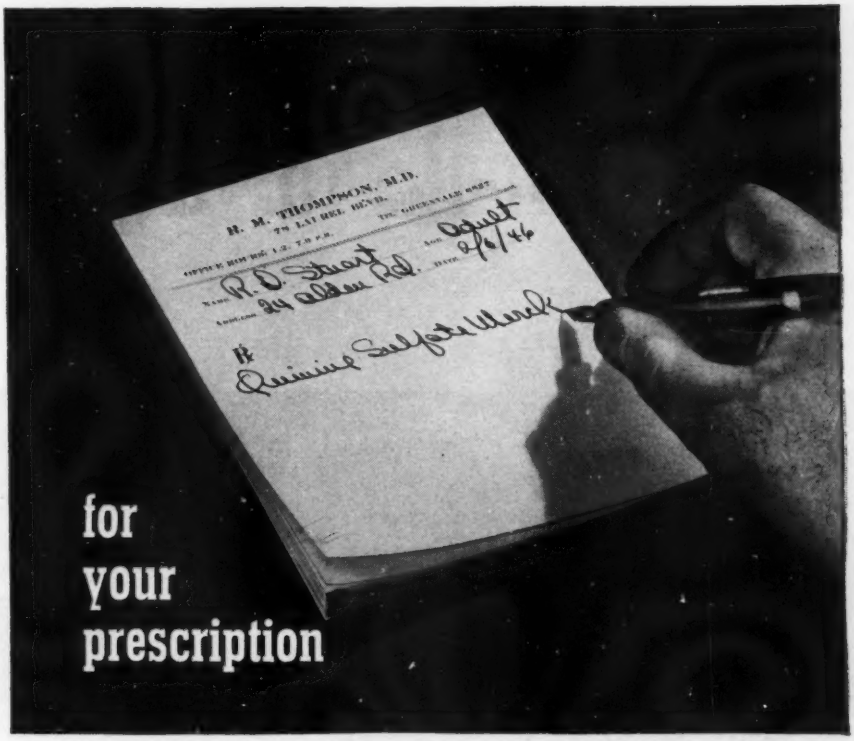
THE WANDER COMPANY, 360 N. MICHIGAN AVE., CHICAGO 1, ILL.

Ovaltine

Three servings daily of Ovaltine, each made of ½ oz. of Ovaltine and 8 oz. of whole milk,* provide:

CALORIES	669	VITAMIN A	3000 I.U.
PROTEIN	32.1 Gm.	VITAMIN B_1	1.16 mg.
FAT	31.5 Gm.	RIBOFLAVIN	1.50 mg.
CARBOHYDRATE	64.8 Gm.	NIACIN	6.81 mg.
CALCIUM	1.12 Gm.	VITAMIN C	39.6 mg.
PHOSPHORUS	0.939 Gm.	VITAMIN D	417 I.U.
IRON	12.0 mg.	COPPER	0.50 mg.

*Based on average reported values for milk.



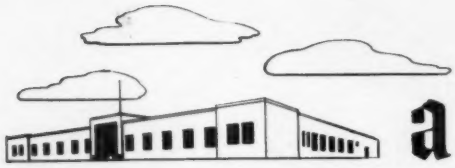
QUININE MERCK *IS AVAILABLE AGAIN*

RESERVED exclusively for the use of our Armed Forces throughout the War, quinine now is released for civilian use as an antimalarial and therapeutic agent.

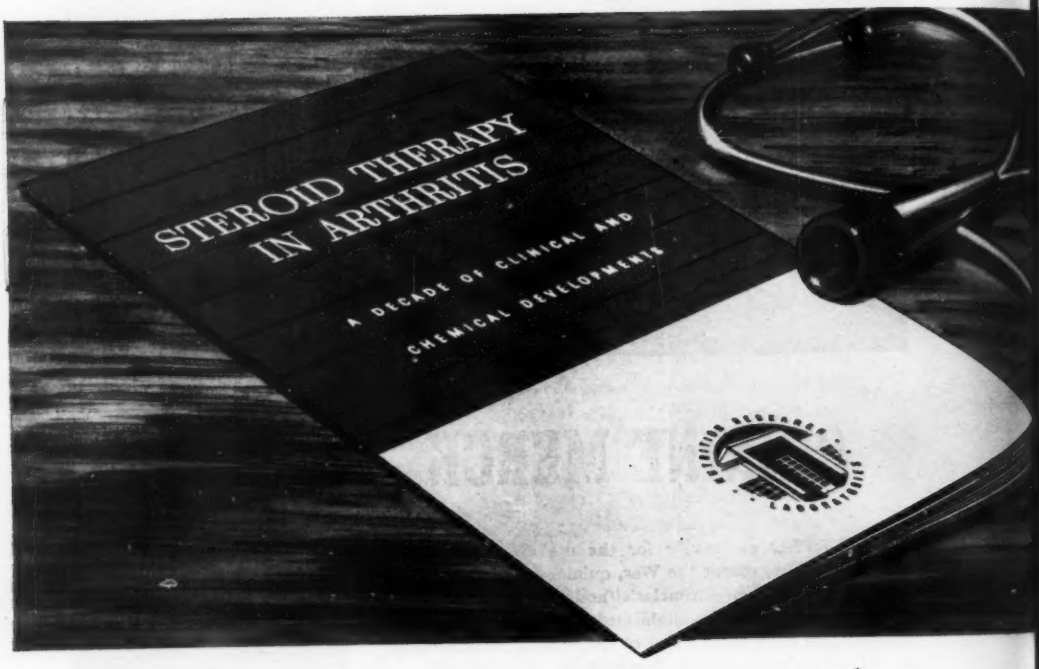
Quinine is thoroughly established as an effective antimalarial and therapeutic agent of low toxicity. It is useful in the treatment of chronic relapsing *P. vivax* infection, the form of malaria seen most frequently among returned Service personnel. Quinine also is effective in suppression and treatment of acute attacks of *P. vivax* infection. Quinine appears to be a safe antimalarial agent available for use when treatment cannot be given under continuous medical supervision.

We are pleased that we can again make this valuable drug available to physicians for the treatment of malaria and other conditions in which it is indicated.

MERCK & CO., Inc. *Manufacturing Chemists* **RAHWAY, N. J.**



a decade



ERTRON IS THE REGISTERED TRADEMARK OF NUTRITION RESEARCH LABORATORIES

# of research

—a handy reference work summarizing investigation into the complex steroid structure of Ertron and its action in the treatment of arthritis.

This book, prepared by the Medical and Chemical Research Departments of Nutrition Research Laboratories, brings the literature on the subject up to date, and describes the therapeutic and chemical uniqueness of Ertron—steroid complex, Whittier. A complete bibliography is included.

"Steroid Therapy in Arthritis" is now being mailed to the entire medical profession. Additional copies will be sent to any physician who desires them. Write to Medical Department, Nutrition Research Laboratories, 4210 Peterson Avenue, Chicago 30, Illinois.

NUTRITION RESEARCH LABORATORIES • CHICAGO

building

a

drop

of

blood

HEMATOLOGISTS have shown that various nutritional elements, coupled with iron, frequently produce a speedier and more satisfactory response in treating secondary anemias.

VI-LITRON Capsules supply:

Special Liver Fraction*
—a high concentration (55 to 1) of the anti-secondary anemia principle.

Iron as Ferrous Sulfate
—the form considered to be most readily assimilated and utilized.

Vitamins B_1 • B_2 • Niacinamide
—deficiency of these vitamins often interferes with maximum absorption of RBC factors.

Vitamin C
—said to be "involved in normal erythropoiesis"; even mild deficiency may cause hypochromic anemia.

In pH 4.5
—gastric hydrogen ion concentration known to be favorable to iron absorption.

*Not a pernicious anemia product

Samples and literature upon request.

U. S. VITAMIN Corporation
250 E. 43rd St. New York 17, N. Y.

Liver • Iron • Vitamins
important red cell essentials in a favorable environment.

VI-LITRON
for Secondary ANEMIA

YES! Paba* has proved itself beneficial in treatment of TICK FEVER

Here's One Case History— Complete Data on Request

One of the discouraging aspects of Tick Fever in the past has been the lack of specific therapeutic agents to combat this disease, once it had manifested itself in the human body.

Recently, however, the actual treatment of a case of Rocky Mountain Spotted Fever (Tick Fever) with PABA* was presented as a first clinical report to the Journal of the American Medical Association by Drs. Rose, Duane and Fischel. A portion of the case history follows:

R. B., a white American woman aged 46 was admitted to the Presbyterian Hospital on the 5th of August, 1945, with a diagnosis of Rocky Mountain Spotted Fever. Thirty-six hours after admission therapy was started with para-aminobenzoic acid, (PABA*), 4 gm. initially and then 2 gm. in 25 cc. of chilled 5% sodium bicarbonate every 2 hours, and the following day 25 gm. total was given. Following the first 24 hours of therapy with para-aminobenzoic acid (PABA*) clinical improvement was evident and continuous, with a rapid decline of fever and alleviation of headache, drowsiness and irritability. Her rash quickly subsided and was almost gone at the end of the first week.

On the whole the drug was well tolerated and produced no toxic effects other than perhaps a moderate depression of leukocytes noted during convalescence.

Ten days after entering the hospital the patient was entirely asymptomatic, and her subsequent course was uneventful. She was discharged three weeks after admission.

*PABA :IVC's brand name for highly purified, medicinal Para-amino-benzoic acid.

INTERNATIONAL VITAMIN DIVISION

American Home Products Corporation
22 E. 40th Street
New York 16, New York

IVC (Reg. U. S. Pat. Off.)
World's Largest Manufacturer of
Vitamin Products Exclusively

IVC
REG. U. S. PAT. OFF.

MAIL COUPON FOR FULL DETAILS

International Vitamin Corporation
Dept. C 22 E. 40th Street
New York 16, N. Y.

Please send me, without obligation, your detailed bulletin on the use of PABA in the treatment of Tick and Typhus Fevers.

Name.....

Address.....

City & State.....

CONTROL...
the Core of Confidence

Your Confidence in Penicillin Schenley
Is Assured by the Vast Program of Control
Maintained at Schenley Laboratories

RIGID CONTROL at *every step* in the production of Penicillin Schenley insures an extremely high standard of purity, potency, and pyrogen-freedom.

This fact...and the *continuing* research procedures which determine production methods at the Schenley Laboratories...are the vital core of the confidence with which you can specify Penicillin Schenley.

PENICILLIN SCHENLEY

SCHENLEY LABORATORIES, INC.

Executive Offices: 350 Fifth Avenue, New York, N. Y.

Announcing

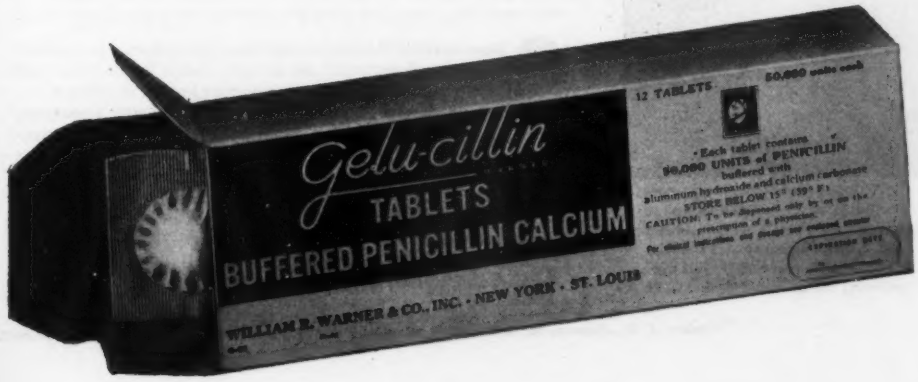
Gelu-cillin 'WARNER'
50,000 units of penicillin per tablet

Gelu-cillin 'WARNER'
Buffered against destructive action of gastric acid

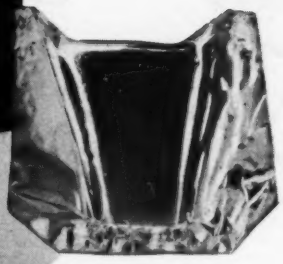
Gelu-cillin 'WARNER'
Convenient to administer... scored for smaller dosage, if desired

Gelu-cillin 'WARNER'
Hermetically sealed in packages of 12...3 strips of 4 tablets

WILLIAM R. WARNER & COMPANY, INC.
113 WEST 18th STREET • NEW YORK 11, N. Y.



EATON LABORATORIES Inc.
NORWICH NEW YORK

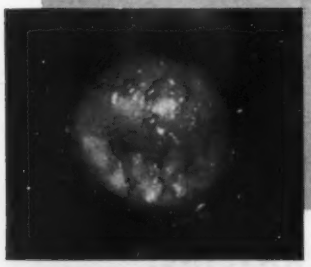


Announces . . .

Lorophyn suppositories

AN ADVANCE IN CONCEPTION CONTROL

with 3 important advantages



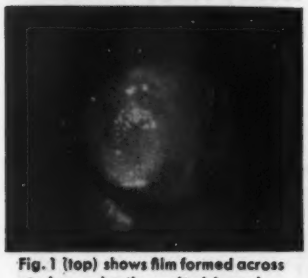


Fig. 1 (top) shows film formed across uterine os by the melted Lorophyn Suppository. Fig. 2 (same subject post coitum) demonstrates tenacity of the emulsion formed by this suppository; the os is still occluded.**

1 **Acceptability.** Many failures of modern methods of conception control are due to one cause: failure of patients to use the prescribed method *faithfully*. The literature abundantly demonstrates this. It follows that the great need in conception control is a method with *patient-acceptance*, yet with maximum effectiveness. Now Eaton announces such a method: a suppository, quick, easy, pleasant and highly effective in use.

2 **Barrier Formation.** In the vagina, the Lorophyn Suppository melts within a few minutes, forming an adhesive film. Figure 1 shows this film occluding the uterine os. The melted suppository is self-emulsifying; it forms a tenacious emulsion with vaginal fluid. Figure 2 demonstrates the tenacity of the emulsion; note that *after intercourse* the os is still occluded.

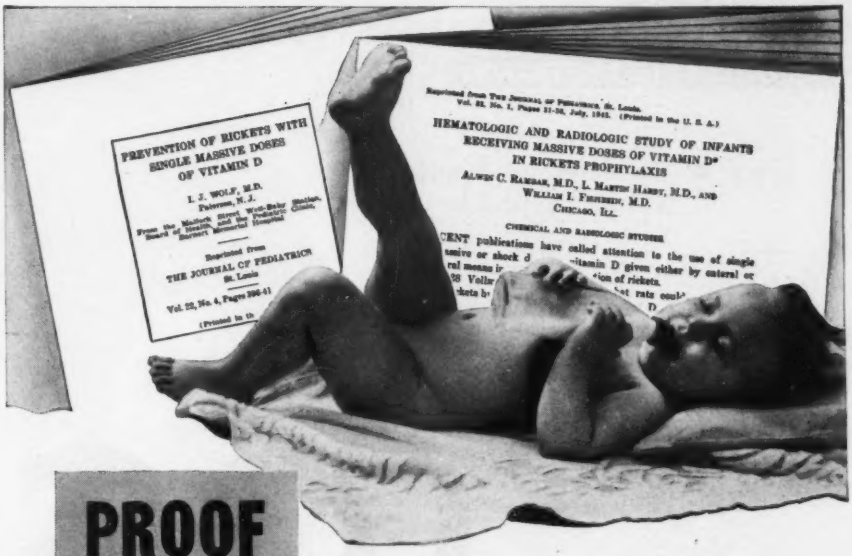
3 **Spermicidal Action.** Lorophyn Suppositories contain .05 per cent phenylmercuric acetate, which Baker et al.* call one of the two most effective spermicides known to science.

These advantages . . . good acceptability, barrier formation, effective spermicidal action . . . indicate that Lorophyn Suppositories should have great effectiveness. This conclusion is borne out by clinical records covering hundreds of patients.

Lorophyn Suppositories are odorless and do not grease or stain the fingers. They are wrapped in leak-proof, hermetically sealed aluminum foil. One dozen is packed in a box.

Additional data are available from The Medical Director, Eaton Laboratories, Inc., Norwich, N. Y.

*Baker, J. R., Ranson, M., & Tynen, J.: Lancet 2:882. 1938. **Photographs by Dr. S. L. Siegler.


PREVENTION OF RICKETS WITH SINGLE MASSIVE DOSES OF VITAMIN D
HEMATOLOGIC AND RADIOLOGIC STUDY OF INFANTS RECEIVING MASSIVE DOSES OF VITAMIN D IN RICKETS PROPHYLAXIS

PROOF

of a revolutionary new concept in rickets prophylaxis

The epoch-making discovery that single monthly doses of high potency vitamin D give full antirachitic protection has been well substantiated by clinical application.

Wolf[1] states, "the administration of a single massive dose of vitamin D for the prophylaxis of rickets is not only of proved effectiveness, but also is safe and time-saving."

Rambar[2]. . ."no toxic clinical or laboratory findings occurred in any of the infants receiving this type of prophylaxis."

Each capsule of Infron Pediatric contains 100,000 U.S.P. Units of Vitamin D—Whittier Process—especially prepared for pediatric use.

Infron Pediatric is readily dispersible in the infant's feeding formula, milk, fruit juices, or water, and can also be given in cereal.

Infron Pediatric is economical—one package contains six monthly administrations, each in an easily opened capsule container.

REFERENCE

1. Wolf, I. J.: Prevention of Rickets With Single Massive Doses of Vitamin D, J. Ped. Vol. 22, No. 4 (April) 1943.

2. Rambar, A. C.: Hardy, L. M. and Fishbein, W. I.: Hematologic and Radiologic Study of Infants Receiving Massive Doses of Vitamin D in Rickets Prophylaxis, Jl. Ped. Vol. 23, No. 1 (July) 1943.

NUTRITION RESEARCH LABORATORIES • CHICAGO

ETHICALLY PROMOTED *Infron is the registered trademark of Nutrition Research Laboratories*

Once a month administration provides adequate dosage for rickets prophylaxis

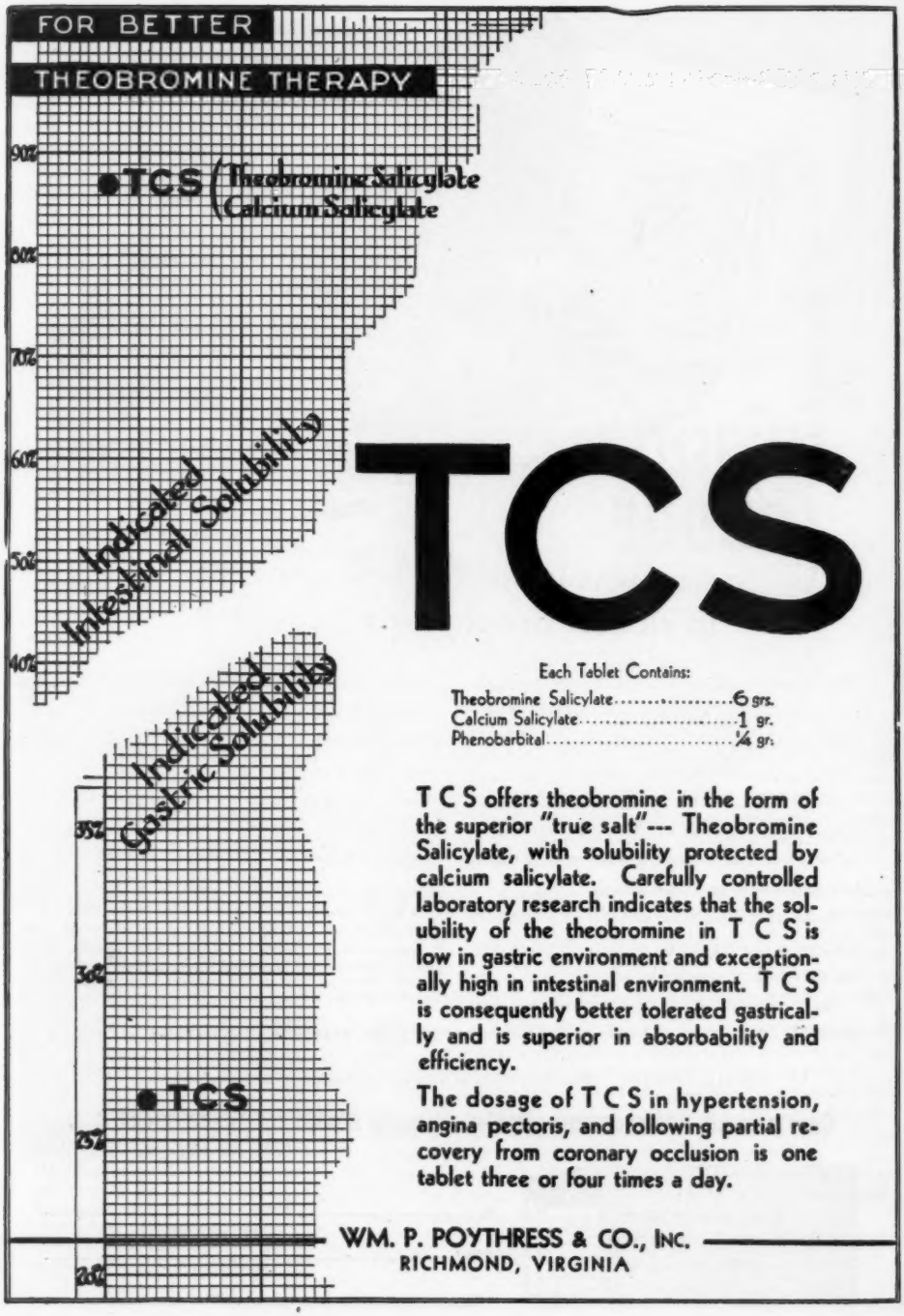
S.M.-7

Please send literature and a supply sufficient for 6 months clinical trial.

DR. _____

ADDRESS _____

CITY _____ STATE _____



TCS

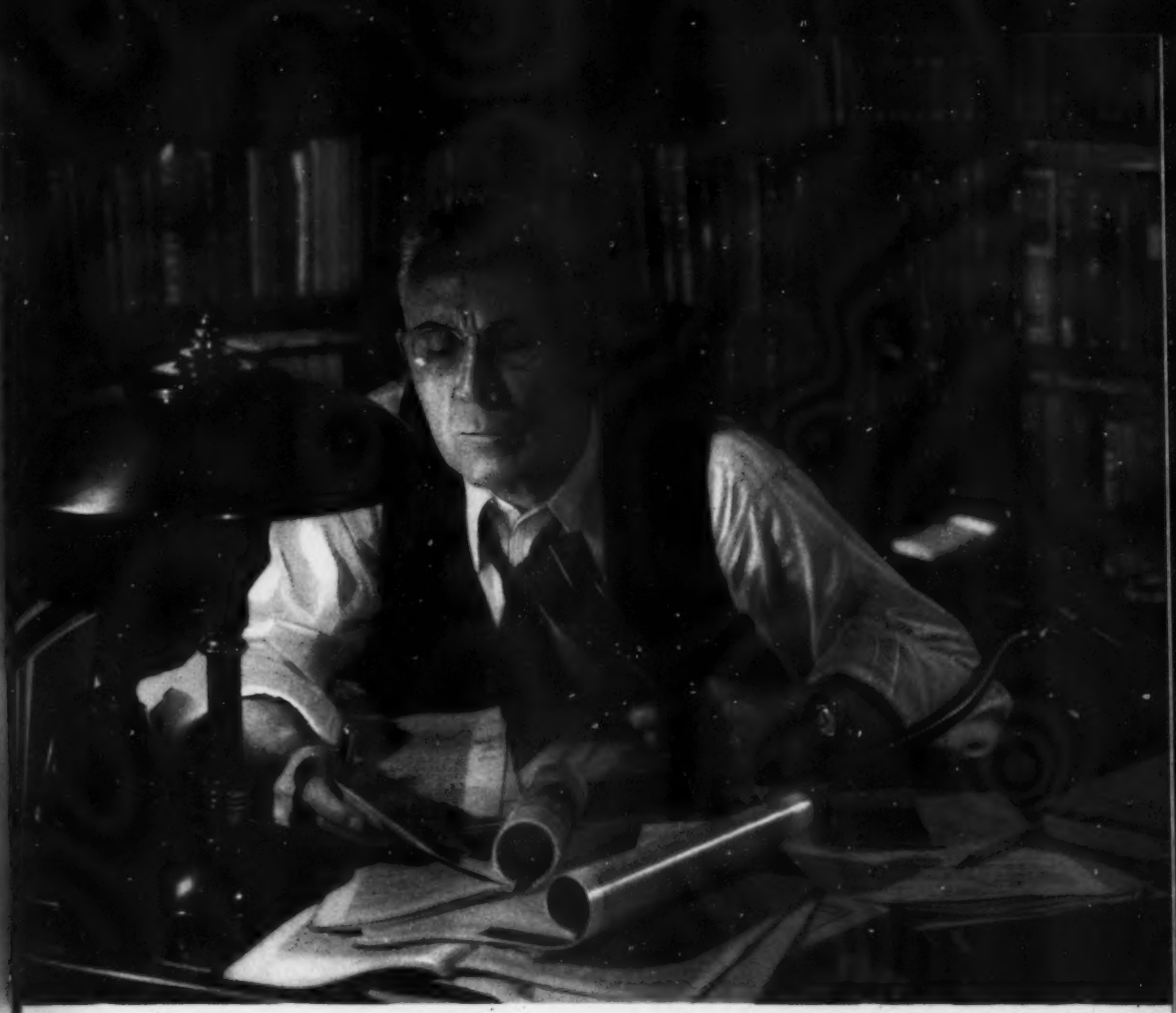
Each Tablet Contains:

Theobromine Salicylate	6 grs.
Calcium Salicylate	1 gr.
Phenobarbital	¼ gr.

T C S offers theobromine in the form of the superior "true salt"--- Theobromine Salicylate, with solubility protected by calcium salicylate. Carefully controlled laboratory research indicates that the solubility of the theobromine in T C S is low in gastric environment and exceptionally high in intestinal environment. T C S is consequently better tolerated gastrically and is superior in absorbability and efficiency.

The dosage of T C S in hypertension, angina pectoris, and following partial recovery from coronary occlusion is one tablet three or four times a day.

WM. P. POYTHRESS & CO., INC.
RICHMOND, VIRGINIA



COLOR PHOTOGRAPH BY KARL GESER

Far into the night

THERE is little rest for the busy physician even after the responsibilities to his patients have been satisfactorily discharged. Medical journals subsist entirely on the writings of physicians. The articles, designed for the purpose of sharing knowledge with others, require arduous toil, and time not available during office hours. It is well to remember then, in reading medical journal papers, that some physician somewhere may have worked far into the night with the hope that his colleagues would benefit.

A similar responsibility is attendant upon the activities of the manufacturer who makes the therapeutic agents which physicians prescribe. Eli Lilly and Company long has sought to disseminate helpful knowledge through the medium of its scientific staff, and through the personal calls of the largest and perhaps the best-informed detail staff the pharmaceutical world has ever known. This system of personal calls, established generations ago, will be continued as long as it proves of mutual benefit.

A picture of The Good Samaritan provided the inspiration that

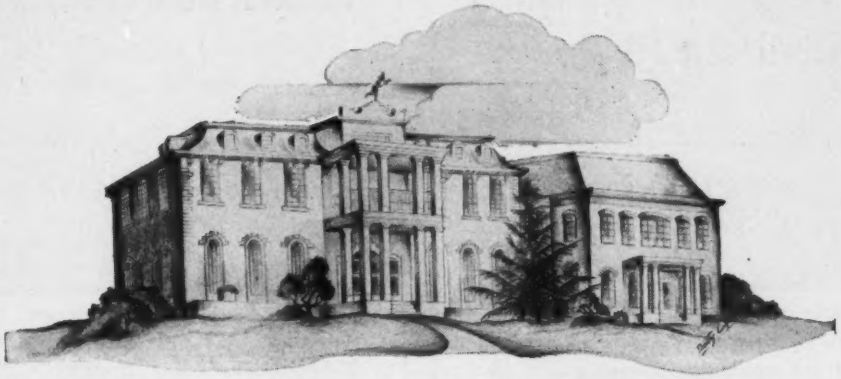
eventually led to the founding of Eli Lilly and Company

Tetanus Toxoid, Alum Precipitated, Lilly

Active immunization against tetanus with Tetanus Toxoid, Alum Precipitated, is an established procedure. A stimulating dose of tetanus toxoid given to a previously immunized individual causes a rapid and high response of antitoxin. • In nonimmunized cases, where there is danger of infection, passive immunity is promptly established through injections of Tetanus Antitoxin or Tetanus-Gas-Gangrene Antitoxin (Combined) Concentrated. A Lilly specification is your guarantee of quality and reliability.

ELI LILLY AND COMPANY • INDIANAPOLIS 6, INDIANA, U. S. A.

ONE OF AMERICA'S FINE INSTITUTIONS . . . . . .



Dedicated to the Scientific Treatment of Nervous and Mental Disorders . . .

. . . In a Setting of Inviting Friendliness and Simple Grace.

BROOK HAVEN MANOR SANITARIUM
STONE MOUNTAIN, GEORGIA

THE NEW YORK POLYCLINIC
MEDICAL SCHOOL AND HOSPITAL

(ORGANIZED 1881)

(*The Pioneer Post-Graduate Medical Institution in America*)

ADVANCED OTOLOGY

A special course in advanced otology including cadaver operative instruction, the recently advocated surgery for petrositis, meningitis, surgery for improvement of defective hearing (otosclerosis), attendance at clinics and lectures, examination of patients preoperatively, witnessing operations, follow-up postoperatively in the wards.

FOR THE

General Practitioner

Intensive full time instruction in those subjects which are of particular interest to the physician in general practice. The course covers all branches of Medicine and Surgery.

FOR INFORMATION ADDRESS

MEDICAL EXECUTIVE OFFICER, 345 West 50th Street, NEW YORK 19, N.Y.

For Patients With Alcoholic Problems

—*The Farm*

A non-institutional arrangement in Howard County, Maryland, for the individual psychological rehabilitation of a limited number of selected voluntary patients with ALCOHOL problems — both male and female — under the psychiatric direction of

Robert V. Seliger, M.D.

CITY OFFICE:

2030 Park Avenue, Baltimore, Md.

TUCKER HOSPITAL, INC.

212 West Franklin St. (Corner of Madison)

RICHMOND, VIRGINIA

This is a private Hospital for the Neurological Practice of Drs. Beverley R. Tucker, Howard R. Masters and James Asa Shield.

The Tucker Hospital is for the treatment of nervous and endocrine diseases. There are departments of massage, medicinal exercises, hydrotherapy and physiotherapy. The Hospital is large and bright, surrounded by a lawn and shady walks, large verandas and has a roof garden. It is situated in the best part of Richmond and is thoroughly and modernly equipped. The nurses are especially trained in the care of nervous cases.

BRAWNER'S SANITARIUM

Established 1910

SMYRNA, GEORGIA

(Suburb of Atlanta)

● *For Nervous and Mental Disorders*
Drug and Alcohol Addictions

JAMES N. BRAWNER, M.D.
Medical Director

ALBERT F. BRAWNER, M.D.
Department for Men

JAMES N. BRAWNER, JR., M.D.
Department for Women

HOYE'S SANITARIUM

"In the Mountains of Meridian"

MERIDIAN, MISS.

Diagnosis and Treatment of NERVOUS AND MENTAL DISEASES, ALCOHOLIC AND DRUG ADDICTIONS. Especially equipped for the treatment of MENTAL DISORDERS and those requiring ELECTRO-SHOCK THERAPY. Convalescents, elderly people and mild chronic mental cases also admitted.

Write P. O. Box 106 or Telephone 524

Dr. M. J. L. Hoye, Supt.

Fellow of the American Psychiatric Association

HILL CREST SANITARIUM

FOR NERVOUS AND MENTAL DISEASES AND ADDICTIONS

Insulin and Electro-Shock Therapy used in Selected Cases. Gradual Reduction Method used in the Treatment of Addictions
Established in 1925

Thoroughly modern in architecture and construction. Eight departments—affording proper classification of patients. All outside rooms, attractively furnished. Several bathrooms and rooms with private bath on each floor. Also a spacious sun parlor in each department. Located on the crest of Higdon Hill, 1050 feet above sea level, overlooking the city, and surrounded by an expanse of beautiful woodland. Ample provision made for diversion and helpful occupation. Adequate night and day nursing service maintained.

JAMES A. BECTON, M.D., Physician-in-charge

P. O. Box 2896, Woodlawn Station, Birmingham 6, Ala. **Phones 9-1151 and 9-1152**

The
Cincinnati Sanitarium
Inc. 1873
For Mental and Nervous Diseases

A strictly modern hospital fully equipped for the scientific treatment of nervous and mental affections. Situation retired and accessible. For details write for descriptive pamphlet.

Emerson A. North, M.D.
Charles Kiely, M.D.
Visiting Consultants
D. A. Johnston, M.D.
Medical Director

ELLIOTT OTTE, Business Manager
Box No. 4, College Hill
CINCINNATI, OHIO

"REST COTTAGE" College Hill, Cincinnati, Ohio

For purely nervous cases, nutritional errors and convalescents.

Completely equipped for hydrotherapy, massages, etc.

Cuisine to meet individual needs.

Emerson A. North, M.D.
Charles Kiely, M.D.
Visiting Consultants

D. A. Johnston, M.D., Medical Director

Elliott Otte, Bus. Mgr., Box No. 4, College Hills, Cincinnati, Ohio.

STUART CIRCLE HOSPITAL

413-21 Stuart Circle

RICHMOND 20, VIRGINIA

Medicine:
ALEXANDER G. BROWN, JR., M.D.
MANFRED CALL, III, M.D.
M. MORRIS PINCKNEY, M.D.
ALEXANDER G. BROWN, III, M.D.

Obstetrics and Gynecology:
WM. DURWOOD SUGGS, M.D.
SPOTSWOOD ROBINS, M.D.

Ophthalmology, Otolaryngology:
W. L. MASON, M.D.

Pediatrics:
ALGIE S. HURT, M.D.
CHARLES PRESTON MANGUM, M.D.

Pathology:
REGENA BECK, M.D.

Physiotherapy:
CONSTANCE PHILLIPS, R.P.T.T.

Surgery:
CHARLES R. ROBINS, M.D.
STUART N. MICHAUX, M.D.
A. STEPHENS GRAHAM, M.D.
CHARLES R. ROBINS, JR., M.D.
CARRINGTON WILLIAMS, M.D.

Urological Surgery:
FRANK POLE, M.D.
MARSHALL P. GORDON, JR., M.D.

Oral Surgery:
GUY R. HARRISON, D.D.S.

Roentgenology and Radiology:
FRED M. HODGES, M.D.
L. O. SNEAD, M.D.
HUNTER B. FRISCHKORN, JR., M.D.
D. V. KECHELE, M.D.

Director:
MABEL E. MONTGOMERY, R.N., M.A.

CITY VIEW SANITARIUM

For MENTAL and NERVOUS DISEASES and ADDICTIONS

Established in 1907

AN ENTIRELY NEW PLANT ERECTED IN 1922

Separate buildings for men and women, ideally arranged and equipped with every facility for the comfort, care, and treatment of the class of patients received.

It is upon the character of service rendered, rather than upon physical facilities that the reputation of such an institution must rest, and to give every patient the maximum of individual attention and unremitting care at all times is the basic principle of our work. An efficient organization exists in all departments. There is maintained an abundantly sufficient staff of capable nurses, divided into day and night shifts, assuring to every patient constant service through each of the twenty-four hours of the day. At midnight this service is as real as at midday.

Situated in the midst of a fifty-acre tract and surrounded by a large grove and attractive lawns.

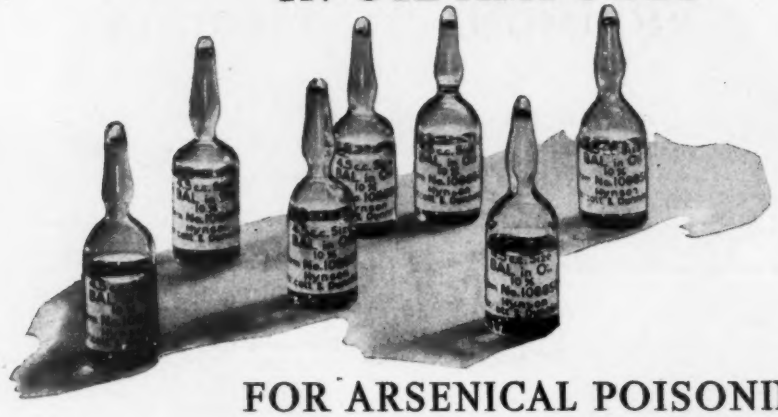
JOHN W. STEVENS, M.D.
Founder

WILL CAMP, M.D.
Medical Director

NASHVILLE R. F. D. No. 1 TENNESSEE

Reference: The Medical Profession of Nashville

BAL (*British Anti Lewisite*)
IN OIL AMPULES



FOR ARSENICAL POISONING

BAL (2,3-dithiopropanol), developed by British scientists to combat the toxic effects of arsenical gases, is considered one of the most important therapeutic discoveries of the war. United States military requirements for sterile ampules were filled exclusively in our laboratories under "secret" classification. Information on this product was recently released jointly by the United States and British authorities and we can now make BAL in Oil available for civilian medical use in the treatment of arsenical poisoning. The product consists of 10% BAL in peanut oil solution containing 20% benzyl benzoate.

Favorable results have been obtained in toxic encephalopathy, arsenical dermatitis and acute hyperpyrexia resulting as complications of arsenotherapy. The efficacy of BAL in other forms of arsenic poisoning and other types of heavy metal poisoning has not been determined.

BAL in Oil Solution, for intramuscular injection, is supplied in 4.5 cc. ampules, packaged in boxes of 10.

Directions for use will be supplied on request.

HYNSON, WESTCOTT & DUNNING, INC.

HW&D

Baltimore 1, Maryland

SOUTHERN MEDICAL JOURNAL

JOURNAL OF THE SOUTHERN MEDICAL ASSOCIATION

PUBLISHED MONTHLY BY THE SOUTHERN MEDICAL ASSOCIATION AT BIRMINGHAM, ALA.

Volume 39 JULY 1946 Number 7

NEUROSURGICAL EXPERIENCES IN THE LUMBAGO-SCIATIC SYNDROME*

By EDGAR F. FINCHER, M.D.
Atlanta, Georgia

The problems of the neurological surgeon among patients suffering sciatic pain were relatively simple and infrequent up until 1934. He was rarely consulted for low back pain. In that year Mixter and Barr[1] published their article on rupture of the intervertebral disk with involvement of the spinal canal. Following this many publications dealing with different features of this subject appeared in the literature. Some were of radiologic value[2 3] concerning the visualization of the disk lesion before operation. Some reported on the spinal fluid changes that occurred in these cases. Other writings were of clinical value delineating the classical symptoms, the surgical technicalities, and others were philosophical discussions concerning diagnosis and treatment. Subsequently, case series studies of statistical value appeared.[4 5] Comparative studies of disk cases with tumors of the spinal cord[6] were made. Later a few contributions[7 8 9] of a positive character were made advocating operation for ruptured disks on the basis of a clinical diagnosis. There is still some controversy as to whether the pendulum of surgical enthusiasm may have swung a bit afar but there is one fact that can be stated without fear of contradiction. The once few and relatively simple neurosurgical problems of the sciatic syndrome in the past decade have grown so that they are now daily, numerous, and many are complex.

It was learned from a survey of over 1,500 neurosurgical records on patients referred with a primary complaint of low back or lower extremity pain, in this past decade, that a very large majority of them were suspected of having a "slipped disk." It was further learned that intervertebral disk problems constituted only one group of four major classifications. Psychological dysfunctions (compensation neuroses), spinal cord tumors and metastatic disease of the lumbar sacral vertebrae and bony pelvis made up the other three main subdivisions of the lumbago-sciatically handicapped patients. In order that there be no misunderstanding it is only fair to state that the greatest volume of these patients were referred by the orthopedic surgeons. A miscellaneous number, all being of different etiology, constituted the fifth group. These ranged from a parasaggital meningioma of the cerebral cortex who suffered sensory jacksonian seizures and a residual "drop-foot," to a case of chronic traumatic osteoporosis of a foot that followed a minor injury to that member. Other specific experiences in this miscellaneous group were cases of endometriosis, ureteral calculi, acute sciatic herpes zoster, osteomyelitis of the femur, Volkmann's ischemic paralysis, *et cetera;* the enumeration of which would constitute a small thesaurus of medical diagnoses. Primitive methods, *in lieu* of statistical charts, photographs, surgical technicalities or an array of clinical case records, will be offered in the hope that a reiteration of some of the clinical features of these first four major groupings will serve to clarify certain concepts regarding the "lame-back-sciatic" syndrome. The comparison of these groups will be made on the basis of the historical information

---

*Read in Section on Industrial Medicine and Surgery, Southern Medical Association, Thirty-Ninth Annual Meeting, Cincinnati, Ohio, November 12-15, 1945.

*From the Department of Surgery, Emory University School of Medicine.

that characterizes each group, the objective neurologic symptoms which they may present and the indicated investigative procedures which may help in the establishment of the correct diagnosis.

Group I. Ruptured Intervertebral Cartilage.—The importance of a detailed chronological history in each case becomes more obvious as the number of one's experiences increases. While it is important to ask rather specific questions regarding certain characteristics of the pain from which these patients suffer, too many such questions do not permit the patient to relate his own observations. The important queries relate to a specific injury, the distribution of their pain and the influences which exaggerate or ease this pain. The great majority of these patients can cite the specific insult that initiated the cartilage rupture. There are other cases of longer duration with repeated recurrent episodes of lumbago or sciatic distresses that have occurred over a period of years. It is not always possible to learn from these patients the exact details of the insult that precipitated the sciatic incapacitation. While a straining lifting experience or a fall into a sitting position are the most common histories obtained, many patients relate the onset of their grief to a simple misstep, an awkward golf stroke or an unusual twisting of the low back. Many a ruptured disk has originated in the activities of the various sports. One such occurred while the patient was beaching a light rowboat, another was precipitated by the patient's suddenly twisting over the edge of his boat to retrieve a disappearing rod and reel. In one unusual history in which the rim of the annulus as well as all of the nuclear material was projected into the spinal canal, the patient related his damage to a hearty, vigorous sneezing act. On further questioning it was learned that on the preceding day, this patient had assisted in dislodging a stalled automobile, at which time he experienced some minor low back pain. When no specific insult can be ascribed by the patient as to the onset of his pain it may be learned by questioning them of physical activities uncommon to their routine of physical living. One learns from the housewife that owing to the sparseness of servants strenuous domestic duties were necessary. Victory gardening, lawn mowing, among those of sedentary habits has been brought out in the histories of the onset of these people's handicaps. These are but a few factors that have been brought out on detailed questioning and illustrate the point that valuable information leading to a correct diagnosis is to be obtained when a patient says he knows of no injury that started their low back or sciatic distress.

The character of and the influences on the sciatic pain of a ruptured disk is extremely valuable. While the back pain is low and usually midline, the radiating pain is constantly to the posterior hip, down the posterior thigh, the

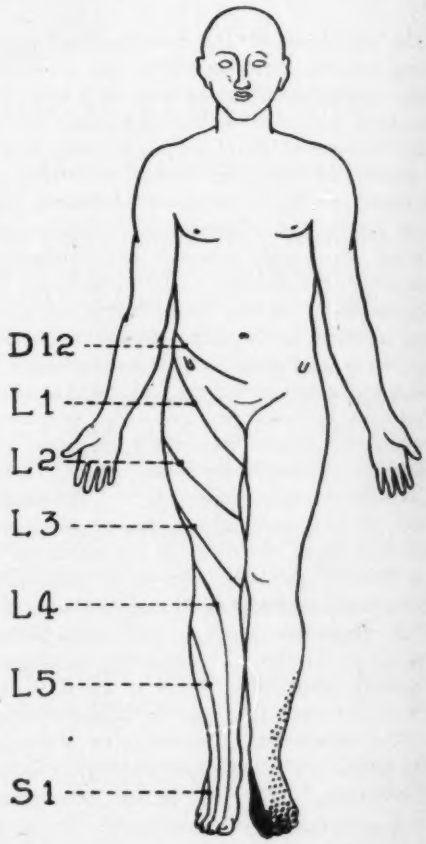


Fig. 1

The sensory changes in the disk cases may be minimal but are confined to spinal root innervations. Posteriorly these sensory impairments may be more positively established following the methods outlined by Keegan.

posterior lateral aspect of the leg, to the outer toes or to the base of the great toe on the dorsum of the foot. The patterns are definitely segmental, persistent, and depend upon the extensiveness of the radiating pain (*Fig. 1*). All simulate each other. The pain is consistently intensified by activities and relieved by prone rest. The influences of coughing and sneezing on these patients' pain has been sufficiently stressed time and again. There is an occasional "disk" patient who is more comfortable in a sitting or standing position for temporary relief but given their choice between standing, sitting or lying, the latter is the universal choice. Forward bending of the body or to the painful side intensifies the radiating pain, whereas lateral bending to the opposite side may alleviate the pain symptoms. Lying on a firm surface is more desirable by these patients than resting upon a soft flexible structure.

The subjective sensory symptoms in the disk cases are minor complaints as is this territorial extent. They are for the greater number of instances transient paresthesias involving the foot and more specifically toes of that foot. Occasionally this impairment in sensation is noted as extending up the outer lower aspect of the leg. When quizzed as to motor handicaps the answers from these patients are those that relate to painful disability and not to any paralytic muscle groups. A rare instance of a mild weakness in dorsi-flexion of a foot may be noticed by such a patient. Bladder or rectal sphincter function is involved only in the rarest instances of cartilage ruptures.

The objective neurologic symptoms in this group of cases are chiefly those precipitated by the painfulness of the lesion. The muscle spasm of the lumbar sacral erecti groups is an index of the acuteness as well as the severity of the nerve root pressure. A point of maximal tenderness is constantly elected on pressure between the posterior spines at the level of the rupture. Abolition of the normal lumbar lordosis is more frequent in those cases where the damage is above the lumbosacral interspace. When straight leg lifting of the opposite extremity exaggerates the sciatic pain of the involved leg one can be doubly certain of a herniated disk. If the "sciatic list" of the upper lumbar spine is missing while examining the patient in a prone or erect position, this scoliotic tilt may be brought out by having the patient bend forward. Constantly the radicular pain in these patients is intensified by lateral bending to the involved side. A measurable atrophy of 1 to 2 centimeters of the calf muscle groups is usually about the only motor symptom. Fibrillary twitchings in the gluteal groups or a flattening of these buttock muscles is not infrequently seen. Sensory impairments are segmental and if the examinations are cursorily or hastily performed may not be brought out. The procedure described by Keegan[10] is a valuable method in eliciting these patterns. Light mobile contact with the skin with a vibrating tuning fork is often helpful in depicting these organic paresthesias. The absence of the Achilles response is the most common reflex pathology in the ruptured disk and is indicative of a lumbosacral rupture or a totally extruded nucleus pulposus at the interspace above this level.

Investigative efforts in this group are in the main, stereoscopic anterio-posterior x-rays of the lumbar and sacral vertebrae, together with lateral views of these same structures. They are in some instances more valuable for their negative value than their pathologic depictions. A narrowed interspace or spaces, an upper lumbar scoliosis, a loss of the normal lumbar curve are the more common confirmations of a disk diagnosis (*Figs. 2* and *3*). A report of "arthritis," focal to one interspace, or a roughened indenture of the cortical posterior surface of the fourth or fifth lumbar body may add weight to one's clinical impression as to the exact location of the rupture.

Group II. Psychological Dysfunctions (*Compensation Neurosis*).—In this group there is always a definite traumatic history and the patient can give in detail the dates, the chronological events and circumstances attending the accident. The relation of these facts by the patients is a tedious, ramifying, prolonged, detailed story of sufferings and mistreatments. They are rather likely to be very specific as to all details. They are usually familiar with the time, date and approximate minute of the hour. If the injury was a fall from a height the accurate distance is known; they are prone to know the exact positions in which they

landed. If the injury is incurred in lifting they know the exact weight of the object lifted, what body torsion occurred or what prompted the body twist and the side to which they twisted. If the lifting was a partnership affair they have full knowledge of their helpers' acts, physical abilities and all the attending circumstances, even to atmospheric conditions present at the time of the accident. Throughout the tedious time consuming relation of their painful stories these patients strain themselves to impress upon one the magnitude of their suffering and incapacitations. This is accomplished by vocal and physical exhibitions. The onset of their pain is immediate, at the time of the accident, continues unabated with a progressive intensity. After a period of relief from work with compensation pay their discomforts may subside to recur with renewed intensity the moment they undertake any return to work. Work is 100 per cent painful. Other influences are variable. Coughing and sneezing may exaggerate their lumbago but not influence their extremity pain. There is no postural help for these people; they are just as miserable lying down as sitting up or standing. They are unable to sleep at night even with analgesics and sedatives. Bending activities persistently exaggerate their symptoms. Resting on a firm surface such as a "boarded" mattress intensifies their pain. They know of no mechanical influences that improve their discomforts. Somewhere in the history-taking on these patients, during the examination or just upon the departure, they are prone to

Fig. 2

The narrowing in the vertebral interspace is helpful in confirming a clinical disk diagnosis. The absence of such a change does not indicate that a rupture of a cartilage has not occurred.

Fig. 3

The narrowed interspace between L V and S 1 often confirms the clinical disk diagnosis. The "poker spine" is more probably indicative of a cartilage rupture above this level.

impress the examiner with their desire to regain their health as outweighing the small weekly compensation check which is tendered them for their physical handicaps. A substitute for this story is likely to be one of his counselor's desire that a complete report of the examination be forwarded to the benefactor.

The radiation of these patients' pain is unpredictable other than it will not be along established physiological courses. Frequently the pain goes up the middle of the back "plumb to the base of the skull." It may radiate down the front of the leg or both legs. It is often difficult to get a direct answer to the exact location of the pain. Many of them escape this question of location by stating it is located "deep in the bone—from the hip to the ankle." The territory of painful involvement in the leg is as variable as the experiences of the traumata that initiated the disability and are never patterned along any organic cord, spinal root or peripheral nerve distributions. More often in these cases than in any of the other groups, one obtains a history of other attending handicaps incurred in the same accident. Headaches, visual disturbances, severe general nervousness, and vertigo are the more frequent additional complaints. If one enters an unsuspected question as to memory, preferably during the examination and after all the battery of details have been recorded, one is frequently surprised at the description of the mental handicaps that were acquired at the time of the low-back insult. If these patients have not volunteered the information concerning their motor symptoms, one learns from questioning, of every type of handicap from a loss of finer toe movements to a completely spastic lower extremity. When one inquires as to sphincter disturbances one gets a universal discourse on constipation or urinary frequency but learns of no organic dysfunctions of the rectal and vesicle musculature.

The objective neurologic examination in these persons is just as time consuming and tedious as are their histories. It requires from two to three times the time and effort necessary in a comparable organically diseased patient. This examination usually begins with the undressing of the patient as he goes through a series of awkward maneuvers to disrobe himself in a most difficult array of physical contortions and frequently ends with an attendant in charge. After a series of bizarre adjustments and descriptions of the painful productions, the patient is ready for examination. He may persist in maintaining a spastic extremity or spine. The muscle spasm of organic pain origin is neither seen nor felt. The normal lumbar curve is present and the alignment of the posterior laminal spines are not distorted. There is no point of maximal tenderness. The weight of the examiner's fingers is extremely painful to the patient. This area of tenderness is very ex-

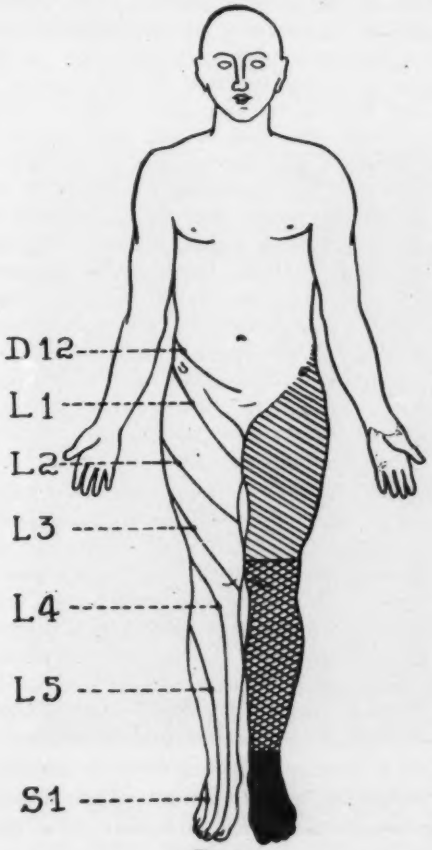


Fig. 4

The sensory losses in Group II are those of well-known hysterical patterns. Straight line demarcations are brought cut in the extremity. Posteriorly these changes may extend as high as the cervical segments.

tensive. Straight leg lifting is probably subjectively impossible and if passively performed, produces all manner of pain which may be diffusely in the back, deep in the thigh, on the anterior aspect of the thigh, behind the knee or radiate up the spine to the cervical region. If only one extremity is painful the opposite one is straight-leg lifted, forcefully and with great agility. There is no pathological "list" of the spine although bizarre postural assumptions are maintained. Lateral or forward bending is frequently prohibited by serious objections or descriptions from the patient. Measurements of comparative muscle groups of the two extremities are consistently the same. Sensory examinations in this group of patients, if not bizarre, ill-defined or indefinite, assume hysterical patterns, beginning with a sock-like loss to the ankle, to a stocking type to the knee or a trouser type to the iliac crest (*Fig. 4*). Not infrequently this pattern will continue in a straight line type of demarkation into the cervical zone. This objectively, in spite of the subjective description that it was confined to the leg or foot of the painful member. Although present posteriorly this trunk loss of sensation may not be found anteriorly. There are times when the patient forgets his position has been reversed and he will have a contralateral sensory loss anteriorly to that which was elicited posteriorly. There are no abnormal reflex changes. In general, all the deep reflexes tend to be a bit intensified but they are symmetrically so.

It is doubtful that more than a thorough neurologic survey is necessary in these problems. Where there are organic findings of an objective character or when a situation demands more than a personal opinion, investigative procedures may be necessary. Should x-ray studies be undertaken, only normal bony structures and relationships will be depicted. If spinal fluid or contrast radiologic studies of the lumbar canal be made, only normal findings will result. Either of these procedures is likely to intensify the subjective symptomatology. If one injects any contrast media into the lumbar sac in this group of patients one should resort to such an agent that may be easily reclaimed or rapidly absorbed.

Group III. Spinal Cord Tumors.—The history in these patients may be the most important clue as to the diagnosis. These patients relate no incidence of injury to the onset of their pain. It is difficult for them to set a date as to the onset of symptoms due to the insidiousness with which these appear. They do not complain of backache of a localized character and if such a complaint is made it is to be learned on questioning that this pain is of a radiating character. In contrast to "disk patients," these people prefer to move about for release of their discomforts and famously give a history of getting out of bed at night and walking about for relief of their pain. They not infrequently experience exaggeration of their radiating pain on coughing or sneezing. Bending maneuvers rarely intensify the pain produced by a spinal cord tumor. When questioned as to the distribution of pain, these patients describe a territorial area compatible with that of spinal nerve root distributions. The progressiveness of these patients' handicaps is in ratio to the passing of time and not to that of activities. The description of the intensiveness of the pain by these patients is not dramatic; it is not of the severe character as described by an acutely ruptured disk patient, nor is it the miserable incapacitation described by the psychologically damaged patient. As a group the duration of the illness in a spinal cord tumor is longer and without remissions than either that of a ruptured intervertebral cartilage or metastatic vertebral disease. When a spinal cord tumor patient gives a history of early sphincter loss or localized muscle group atrophy, the lesion is more probably an intrinsic one and located at the lumbodorsal level. Sphincter involvement occurs late in the development of low cord tumors and a history of bilateral sciatic pain is more likely in such instances.

Objective neurologic findings in early spinal cord tumors of the lumbosacral territories may be entirely absent. This absence of symptoms makes the differential diagnosis in a small number of instances very difficult. In general, none of these early lesions exhibits any real painful handicaps on motion, muscle spasm phenomena

are absent, they do not list, and they have no point of tenderness on interspinal digital pressure. "Fist percussion" over the suspected level with a patient's lumbar spine slightly flexed may reproduce the radicular pain. Unless the tumor is quite advanced in size, abolition of the normal lumbar curve does not occur. Straight leg lifting (Lasegue's sign) may be positive in spinal cord tumors but not with the degree of frequency seen in ruptured disks. Sensory changes are more common and are more definitely defined in cord tumors than in "disk" or metastatic groups. These sensory impairments or losses are always of an organic pattern and are confined to physiologic territories (*Fig. 5*). Such changes depend upon the tumor level within the spinal canal. In general, if the sensory loss is in the anterior thigh and upper calf, never above the inguinal fold, the tumor is probably in the upper lumbar canal. The more distally located growths that involve the sacral roots primarily result in gluteal, buttock and pedal sensory alterations. Frank motor disturbances in the nature of a spastic paralysis of a unilateral or bilateral character are indicative of spinal cord and not lumbar-sacral spinal root involvement. A foot-drop, single or bilateral, is a more likely motor handicap than any complete extremity paralysis. Muscle group atrophies, like spasticities, are more probably of intrinsic cord damage than pressure on the nerve roots of the filum terminale. Suppression of the deep reflexes occurs only when the spinal nerve root pressure has progressed to a degree

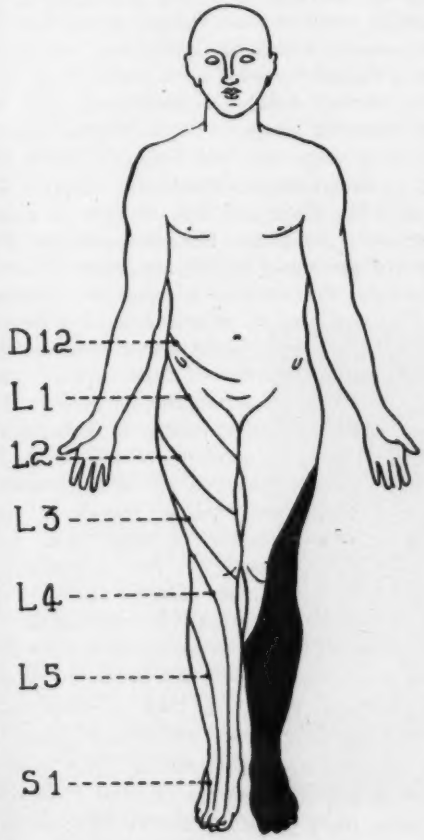


Fig. 5

The objective sensory changes in Group IV may be absent and lending impressive weight to a disk diagnosis. When the losses are present they are confined to well-established physiologic distributions.

Fig. 6

This patient gave a history of radium treatment to the cervix 16 years before the onset of her lumbago and sciatica. Complete investigations failed to establish any cancer disease. She was explored for a disk. None was found. Eleven months later the right leg was similarly involved and malignant disease of the right sacrum and pelvis was first depicted. Subsequent studies proved this to be a carcinoma of the cervix with continuity spread to the bony structures.

that the motor-sensory reflex arc has been completely compressed.

Routine stereoscopic lumbar sacral x-ray films may reveal a widening of the interpedicle measurements, rarely a thinning of the laminal arch, and are usually normal radiologic depictions of these vertebrae. The interspaces are not narrowed and rarely is the lumbar curve ironed out. Spinal puncture done below the tumor level reveals an obstruction to the increase of spinal fluid flow on bilateral jugular vein compression. This spinal fluid protein content is elevated to its highest contents in these obstructions. Contrast radiologic studies (1 to 2 c. c. spinal iodized oil) gives accurate confirmation of the tumor level.

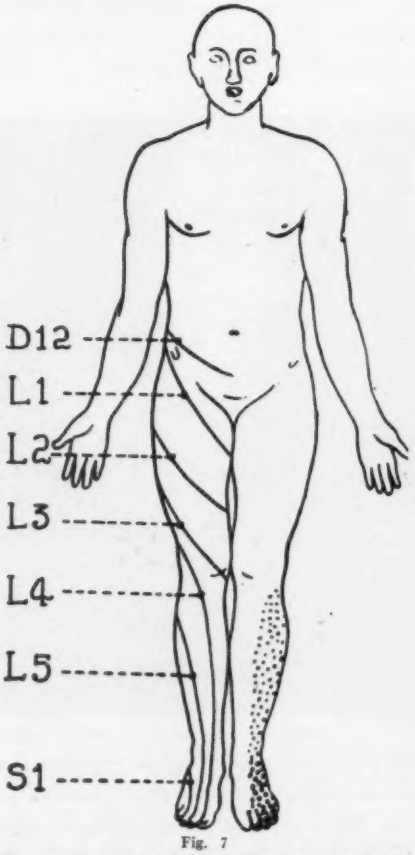


Fig. 7

The sensory patterns of Group IV are more commonly hyperesthetic, rarely too discreet and more subjective than objective in location.

Group IV. Metastatic Disease, Invading the Pelvis or Lower Vertebrae.—In this group of sciatic syndrome cases the historical information may not be specific but there may be learned from these patients of a previous "tumor" operation, x-ray or radium treatments, that have been tendered in their past. A bronchogenic metastasis to the fourth lumbar vertebral body was suspected in a healthy intern who had been denied military service because of a "suspicious spot" in the routine x-ray examination of his chest. A pelvic malignancy with extension into the ischial ramus was found on x-ray of the pelvis because of the history of cervix radium therapy for so-called "menopausal bleeding" (*Fig. 6*). A traumatic history as a factor in the onset of these patients' back and leg pain is extremely rare. However, more than one pathological fracture of a lumbar vertebral body with acute lumbago-sciatic incapacitation came on with straining injury to the back. One experience in a suspected "disk patient's" story was that he had, without any attending injury, fractured a rib. Biopsy of this was that of a carcinomatous transplant. His lumbago-sciatic picture of three weeks rapidly transformed into a paraplegia, the result of a destructive invasion of the third lumbar vertebra. In any person who has had any type of tumor removal, one to ten years previously to onset of back pain and who develops subsequent nerve root involvement, metastatic disease is to be seriously considered. This is particularly true of transurethral prostatic resections for benign prostatic disease. The other common history in this group of patients is that of weight loss, preceded by a loss of energy. There is frequently a history of malaise that precedes the onset of pain by a period of weeks or even months in some instances. It is extremely rare that one learns from these patients any history of recurrent preceding attacks of back or sciatic distresses. The pain from which they suffer is extremely acute and excruciating. Not always is their pain influenced by postural variations but when there is such a history vertebral invasion rather than bony pelvis involvement is likely to be found on x-ray investigations. Pelvic malignancies by spread of continuity to the

lumbosacral plexus do not give rise to too specific localizing territorial pain. The history from this patient is that the pain is deep in the extremity, whereas pain from vertebral body destruction is likely to be more discreet and along definite segmental distributions. Coughing or sneezing is reported in most of these cases as playing no role in intensifying the symptoms. Sensory losses or impairments in one or both lower extremities are in ratio to the duration of the disease and are patterned by the structures diseased (*Fig. 7*). Vertebral or laminal arch invasion may cause segmental loss of all forms of radicular sensations. Bilateral, complete loss of all sensations is indicative of disease within the spinal canal. Invasion of the pelvis wing or ischial rami may cause no paresthetic objective symptoms. The great number of these patients have noted skin temperature changes and many of them relate a story of a cold foot or leg as compared with the uninvolved extremity.

The motor handicaps complained of by this group of patients are early in the invasion of the secondary disease and are not too specific. A vague generalized weakness, a minor foot-drop or an observation that the calf muscles have become atrophic may be the only subjective motor handicaps. Later on in the progress of the disease, monoplegic or paraplegic handicaps of a flaccid type may be described by the patient. Bladder and rectal sphincter dysfunctions are more common in this group than in any of the other three subdivisional groups and may occur before any other serious motor disturbances.

The objective neurologic symptoms in this "cancer group" may be misleading in the ambulatory group and simulate the disk cases in that grossly the major findings on examination are those of a painfully handicapped patient. Muscle spasm of the lumbar erecti groups are not uncommon. Not so much is interspinal deep pressure painful but pressure on a posterior spine of an underlying diseased lamina will be extremely painful. Bending movements may or may not produce pain. Bending activities are not likely to reproduce the patient's pain if the pelvis bone instead of a vertebral invasion is present, provided the acetabular cavity itself is not involved. Postural deformities are present in ratio to the amount of vertebral bone disease. Straight leg lifting may or may not reproduce these patients' extremity pain. In one instance where extensive hip joint destruction had occurred, the patient described a classical radiation of sciatic pain to the outer toes of the foot. Measurable muscle group atrophies are rather likely to be symmetrical, general and the result of disuse. Frankly paralytic muscle groups are found late in the progress of the metastatic disease as are reflex changes. An absent Achilles reflex may serve to divert one's attention more to a disk diagnosis.

Fig. 8

This patient entered the hospital with a history of acute low back and immediate sciatic pain. There was a history of a back sprain that initiated the onset of symptoms. Pain on coughing, sneezing and bending and paresthesias involving the outer toes of this left foot prompted a diagnosis of a "slipped disk."

Fig. 9

This osteophyte reaction has been proven in more than one case to be the earliest manifestation of invasive metastatic disease.

Investigative procedures in establishing the diagnosis in this group may be extensive. Routine lumbar-sacral spine films may be negative or may be very positive for metastatic characteristics. Chest films have frequently revealed a primary or secondary lung invasion. Sedimentation rate studies have been helpful in some instances. Urologic, gynecologic and gastroenterologic investigations may be necessary. In many instances a time lapse is necessary before accurate radiologic depictions bring out the real cause for the lumbago-sciatic symptoms. In a patient who gives a history of some previous tumor operation, irrespective of the organ of origin, and whose lumbar x-ray films reveal an early disruption of the vertebral body bony cortex (*Fig. 8*), repeated studies may soon establish the diagnosis.

In summary, it can be stated that the lumbagosciatic syndrome is an extremely complicated grouping of symptoms, the dominating features being low back and leg pain (*Fig. 9*). The etiologies are numerical and they are problems of almost every field of clinical medicine and surgery. An accurate diagnosis is imperative if proper treatment is to be instituted. In a large series of experiences one can group these into major subdivisions according to the primary causative factors, but there still remain many single experiences all of different origins that demand individual study and investigations before a diagnosis can be established.

BIBLIOGRAPHY

1. Mixter, W. J.; and Barr, J. S.: Rupture of Intervertebral Disc with Involvement of Spinal Canal. New England J. Med., **211**:210 (Aug.) 1934.
2. Hampton, A. O.; and Robinson, J. M.: The Roentgenographic Demonstration of Rupture of the Intervertebral Disk After the Injection of Lipiodal, Etc. Am. J. Roentgenol., **36**:782, 1936.
3. Bell, J. C.: Apparatus for the Study of Opaque Media in the Spinal Canal. Am. J. Roentgenol, **37**:416, 1937.
4. Grant, F. C.: Intervertebral Disks, Operative Results. J. Neurosurg., **1**:332 (Sept.) 1944.
5. Ver Brugghen, A. H.: Herniated Nucleus Pulposus: Report of Seventy-Five Cases. Dis. Ner. System, **4**:165 (June) 1943.
6. Love, J. G.: Differential Diagnosis of Intraspinal Tumors and Protruded Intervertebral Disk and Their Surgical Treatment. J. Neurosurg., **1**:275 (July) 1944.
7. Semmes, R. E.: Diagnosis of Ruptured Intervertebral Disc Without Contract Myelography. Yale J. Biol. & Med., **11**:433, 1939.
8. Dandy, W. E.: Concealed Ruptured Intervertebral Disks: Plea for Elimination of Contrast Medium. J.A.M.A., **117**: 821, 1941.
9. Dandy, W. E.: Improved Localization and Treatment of Ruptured Disks. J.A.M.A., **120**:605 (Oct.) 1942.
10. Keegan, J. J.: Dermatome Hypolgesia Associated with Herniation of Disk. Arch. Neurol. & Psych., **50**:67 (July) 1943.

HISTORY OF HEMORRHOIDAL SURGERY*

By CHESTERFIELD J. HOLLEY, M.D.
Wheeling, West Virginia

We are meeting again today to exchange views on a branch of medicine that has taxed the imagination of man for over 4,000 years, according to early translations. The subject I am to review is old and is among the first conditions disclosed as contributing to the discomfort of mankind. The suffering and lamentations of the afflicted have come to us as vividly as any morsel of history. The disease is so dreadful and

*Read in Section on Proctology, Southern Medical Association, Thirty-Ninth Annual Meeting, Cincinnati, Ohio, November 12-15, 1945.

pain so aggravating that through ancient and Biblical times no worse punishment could be promised an individual or race of people. Interest was forced upon our ancestors because of the agony of the unfortunate, the ease with which the site of trouble could be viewed and the accessibility of the area. Favorable circumstances gave antiquity to anorectal conditions and places them among the things that were first in importance in the minds and eyes of individuals. Because a long line of notable surgeons and philosophers in medicine has contributed much to the comfort of man, so that no longer is the disease of hemorrhoids to be feared as a curse or even to be tolerated, we should possess a feeling of exultation and a sense of triumph. If in some way we have assisted to preserve the continuity of such illustrious characters we are justified in our pride.

The logical approach to this subject appears to be through a brief review of the history of hemorrhoids and in so doing, I shall, for interest's sake, mention fistula and colostomy. The disease is mentioned in the Code of Hammurabi (2200 B.C.).

"If a doctor has cured the diseased bowel, the patient shall give 5 shekels of silver to the doctor."

Eber's Papyrus from Egypt (about 1550 B.C.) describes the condition probably with associated dysentery. The Hindus (about 1000 B.C.) refer to the disease. Hippocrates' works (460-370 B.C.) quoted many authorities, considered any disease about the anus as hemorrhoids and frequently a favorable or even useful condition, attributing the phenomenon of "flowing" to a general purification of the organism. The hemorrhoidal flow, formed

"by the reunion of all the wastes of the body, is made up mainly of blood of the spleen and of the bile, which is drawn out, that is to say out of the spleen and escapes through the hemorrhoids as from the rectum."

Hippocrates also believed hemorrhoids prevented other diseases such as pleursy, pimples, boils and perhaps leprosy. He thought there was a relationship between liver disease and hemorrhoids, and ascites. The word hemorrhoid was used interchangeably with hemorrhage because it literally means "flowing." The Bible used the term "emerods."

Celsus (about 25 B.C. to 40 A.D.) agreed with the theories of Hippocrates.

Galen (second century A.D.) said that ascites could be caused by blood retained in hemorrhoids.

The fall of Rome disrupted western progress in surgery. We next hear from Aetius, physician to the Court of Constantinople, who advises cautery for procidentia. Paul of Aegina, supposed to have lived in the seventh century, in his account "Of things Medical, In Seven Books," a compilation, quotes from Leonidas (about the first century A.D.),

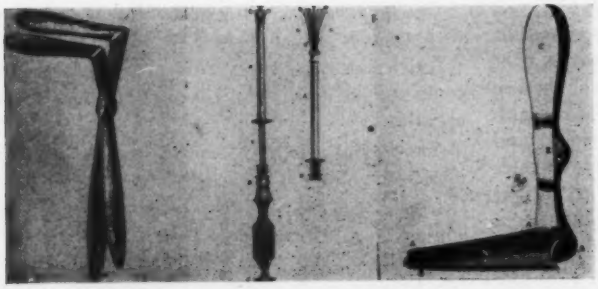
"Hemorrhoids can be removed by cautery after ligature, or (following Leonidas) by being compressed for some length of time with a crushing instrument and then cut off."

In 1819, from the buried ruins of the city of Pompeii (A.D. 79) an anal speculum with other instruments was found in a surgeon's house, also a vaginal speculum. From Milne we learn that the rectal instrument was called "small dilator or catopter;" the vaginal speculum "magnum dioptra or large dilator." Paul also tells of the custom of inserting a tube, of lead, bronze or tin to prevent contraction, spasm and adhesions. These tubes were also described by Celsus in the first century.

The rise of Mohammedanism for the next four or five centuries caused reports, principally on fistula, to come from the East by the following Arabian authors: Haly Abbas (tenth century), Albucasis (died 1013), Avicenna (died 1037).

In Europe during the medieval period we hear about William of Salicet (1210-1280) who preferred the cautery for fistula. His experience with this instrument in hemorrhoids encouraged him to attempt its use in curing fistula.

John Arderne (born 1307) settled in England in 1370. He was ahead of his time, and is remembered for his treatise on fistulas. Among his works was included a description of hemorrhoids which he acknowledged taking from the writings of Lanfranc (died 1316). He avoided the use of the cautery in treating fistulas. His teachings failed to impress the masters, for in 1422 Henry V of England died from the effects of fistula at the age of 35. Hume's "History of England" says, "which surgeons at that time had not skill to cure." The



A B C

Fig. 1

A, anal speculum in bronze, found in the ruins of Pompeii. B, diverging crochet hook of Chaussaignac, used to bring forth hemorrhoids by inserting the instrument closed, and withdrawing it with the hooks diverging. C, anal speculum illustrated in the Dictionary of James (1760). (Bensaude, R. *Presse med.*, 45:1391, 1937.)

A B

Fig. 2

A, operation for hemorrhoids done by Aetius. The surgeon has pulled down the hemorrhoids with a hook and has cut them in a circular manner with a large blade. B, from the same period, showing the surgeon exerting finger compression to the anus after excising the hemorrhoids. Notice the spurt of blood falling into the cup. (Bensaude, R. *Presse med.*, 45:1391, 1937.)

Fig. 3

German woodcut of the fifteenth century showing a country innkeeper retracting one buttock with his hand, showing his affliction to the surgeon. The peripatetic surgeon treats his patient while his horse waits.

weight of authority was against him as surgeons for nearly 500 years after his death preferred to mortify their wounds and use incarnatives.

France at this time had one Monseigneur Felix (de Tassy) who after one year's practice upon patients successfully operated upon Louis IV, November 18, 1687, for fistula. The royal bistoury is still preserved. His handsome fee amounted to more than $30,000.00 today, his first assistant received the equivalent of $20,000.00 and all in attendance were paid $1,000.00 each.

Colostomy was first done in 1766 by Pillore (Rouen) after being suggested by the famous anatomist Alexis Littré in 1710. Callisene of Copenhagen advised lumbar colostomy in 1770, but it fell to Amussat, of Paris, to make use of his idea sixty-nine years later in 1839.

Belief that hemorrhoids were a reservoir for waste, continued for centuries. George Ernest Stahl (1660-1734), a German physician to the King of Prussia, and professor of medicine at Halle, adhered to the ancient idea. He thought the venous channels collected and later rejected waste; that flow from hemorrhoids was a vital act due to phethora and not disease; the flow was not splenic in origin, but an overflow. However, Morgagni in the seventeenth century observed that hemorrhoids did not exist in animals and attributed the cause to the erect position and to hereditary predisposition. The theory of defective circulation was first published in the Dictionary of James (1760) drawing attention to the difficulty blood encounters in getting from the hemorrhoidal veins

to the portal veins because the vertical veins possess no valves. Quenu in the nineteenth century introduced the idea of inflammation as the pathological cause.

A most notable year was 1830 when John Houston, then 28, described the valves that bear his name today. He died of overwork at 43, but lived long enough to see a tiresome individual named O'Beirne discredited after many violent arguments and attacks upon what was obviously true. Another important year in this field of surgery was the memorable date of 1835, when Mr. William Salmon established St. Mark's Hospital in London, for fistula and other diseases of the rectum. This was the first institution in the world to devote its work exclusively, to diseases of the anus and rectum. This hospital chair is still one of the most enviable in the world today.

In the United States, care of rectal and anal diseases fell into the hands of the general surgeons, Physick and George Bushe. James M. Mathews, of Kentucky, found conditions distressing and unsatisfactory in New York City, where he journeyed for special study in rectal surgery. Only one man was doing rectal surgery; he found it necessary to cross the Atlantic to St. Marks and with the Allinghams made a lengthy stay. He returned to America to be the father of American proctology. The ex-president of the American Medical Association became the first president of the American Proctologic Society in 1899. In 1916 the section on proctology in the American Medical Association was organized and became associated with the section on gastroenterology.

History has not only come to us in writing, but also in song. Few realize, when we listen to Goethe's "Faust," that the editor, Nicolai, is referred to as a "proctophantasmist." One of Mephistopheles lines during the Walpurgis night reads: "He now will seat him in the nearest puddle, the solace this, whereof he's most assured; and when upon his rump the leaches hang and fuddle, He'll be of spirits and of spirits cured."

Heinrich Heine, the poet, says that Meyerbeer had hemorrhoids and Heine is said to have written poetry about the "hemorrhoidal music" of that great composer. Martin Luther, the great reformer, suffered from prolapsed hemorrhoids, and described his illness at great length in a letter to Justin Jones in 1528.

Don Juan, of Austria, who won the battle of Lepante (1571) died, at Namur, of hemorrhage four hours after incision was made for a large cluster of hemorrhoids.

Strangely the treatment of hemorrhoids has

Fig. 4

The "Royal bistoury" with which Louis XIV was operated on by Mons. Felix. (*Esmarch, "Deutsche Chirurgie."*)

Fig. 5

Homemade instruments devised by a country practitioner in Massachusetts, about 60 years ago, for treatment of stricture of the rectum. Bougies (roughly graduated) of old-fashioned diachylon plaster wound about a core. The dilator (above) is made from wood and metal, working somewhat like the modern urethral dilators. (Description and photograph furnished by *Dr. Ralph W. Jackson.*)

been remarkably similar in principle throughout history. Hippocrates employed ligature, excision and cautery. Cure had to be established by eradication, and what else could be considered but tying, cutting and burning? It was impossible to convert the abnormal to normal except by fundamental methods. Progress has been made by refinement and technic, at first crudely executed. Centuries later after a thorough understanding of anatomy the operation is performed with grace and judgment. Other points of interest that apply to present day methods are the use of heat. Moses Maimonides (1135-1204) the peer of the twelfth century was probably the first to recognize the benefits thereof. He said: "Another valuable procedure is to sit in warm water in which various medicaments were included." Brodie of St. Georges' Hospital appears to be first in recommending sphincterotomy routinely in ulcer and where the muscle is tight. Recently Dr. E. T. Whitney of the Boston Dispensary advocates this procedure in all hemorrhoidectomies.

Mathews classified treatment into two groups: palliative and radical. He condemned the palliative in no uncertain terms as not a cure and an injustice to the patient, that cure was only to be had by operation. He said there were thirteen operative methods, but only described six. Apparently this is the number deserving consideration. Allingham lists eleven and names and describes them as follows:

(1) Excision with knife or scissors. Hemorrhoids are seized at their base, cut off and not released until bleeding is arrested by torsion of the arteries, rarely more than two. Dupuytren, Sir Ashley Cooper and many others acknowledged the danger of this operation from hemorrhage.

(2) The chain of Chassaignac, he describes as barbarous and unsurgical. The wire of Maisonneuve also used with slightly less danger causes stricture and removes too much mucous membrane. Hemorrhage and pain are other reasons for rejection.

(3) Application of various acids and caustic pastes was practiced mostly in Germany and France. Several applications of strong caustics were used, for example: zinc and calcium chlorides, sulphuric, nitric and carbolic acids.

(4) Injections were palliative for the most part. First introduced by Morgan of Dublin in 1869, they soon drifted into the hands of charlatans in the United States. Chief among these was a man named Mitchell of Clinton, Illinois. A long list of solutions were used. Among which were carbolic and nitric acids, creosote, iodine, and perchloride of iron.

(5) In cauterization puncture, the hot iron was thrust deeply into each pile two or three times.

(6) *Galvanic Cautery.*—Allingham says there was no good reason to use the battery to heat a wire instead of a heated iron.

(7) The clamp and cautery were originated by Mr. Cusack, of Dublin, and first introduced into London by Mr. Henry Lee at St. Georges' Hospital, but popularized by their ardent advocate Mr. Henry Smith. Kelsey in this country approved of it, thereby aiding materially in its continued practice.

(8) *Dilatation of the Sphincter Muscles.*—The internal and external sphincters were completely dilated by the use of thumbs, first anterioposteriorly and then laterally. No cure was established, but an irritable sphincter was put at rest.

(9) *Crushing.*—Mr. George Pollock, of St. Georges' Hospital, in the Lancet, July 3, 1890, advocated treatment by crushing after a successful two to three years experience. It did not sufficiently crush. Even Herbert Allingham's improved instrument was not satisfactory. The stump was open to infection, pain was often severe, and hemorrhage was profuse.

(10) *Mr. Walter Whitehead's Operation.*—The *British Medical Journal* of February 6, 1887, published a description of this operation after discussing the disadvantages of the ligature, and the clamp and cautery technic. Scarcely was there ever such an array of noted men to condemn a surgical procedure: Gross, Erichson, Van Buren, Allingham, Sr. and Jr., Hall, Wyeth, Straus, Bull, Copeland, Bush, Cook, Sir. Benjamin Brodie, Syme, Curling, Quain, Ashton, Gowlland, Cooper, Goodsall, Gerster, Bodenhamer, and many others all agreed that the ligature operation is the simplest and most radical cure for internal hemorrhoids. This long list of notables is given because recently in the Janu-

ary, 1945, issue of the *Cincinnati Journal of Medicine*, there appeared an article by Joseph Decourcy favoring this most radical operation as originally proposed. None of the modifications of Tuttle, Earle or the Allinghams are even considered. The author disclaims practically all the original and all the accumulated objections.

(11) The ligature operation devised by Mr. Salmon at St. Georges' Hospital has continued to this day the most accepted operation. Many modifications have been introduced and many of these, together with new instruments have improved the technic, made the operation practically safe from infection and hemor hage, and reduced to a minimum postoperative complications and pain, but fundamentally the operation is the same. Attesting to this are the names of all the outstanding men in the field, past and present.

National Bank Building

DISCUSSION (*Abstract*)

Dr. C. E. Howard, Cincinnati, Ohio.—I saw in the paper the other day that history has been shoved back an additional two thousand years. It seems the archeologists in exploring a hundred miles north of ancient Babylon have discovered what they claim now to be the first city. The written record of hemorrhoidal disease does not seem to go back much more than four thousand years but no doubt this disease, which is very apparent to the naked eye, attracted much attention not only for that reason but also because many persons are afflicted with it.

I suppose the ancients had gallbladder trouble and appendicitis and they could not see those conditions so they did not do so much about them.

In times past hundreds of literary articles have been published on the subject of hemorrhoids. In the Roman, the Greek, Arabic, Egyptian, and Islamic countries these have all been tabulated by Haller and Kortzenfeld. The treatment in antiquity, and in the Middle Ages, was mostly surgical; however, Celsus used arsenic paste as well as the cutting operations.

Hippocrates thought hemorrhoids were due to stagnation of bile and phlegm, and among the methods used then, which do not differ a great deal except in their application, Hippocrates used the actual cautery. It is said that if the patient cried out, it assisted the application of the cautery because of additional occlusions.

The ancient methods were rather rough.

I suppose that the oldest operation which was habitually performed is circumcision. Hemorrhoidectomy is probably second. We have not changed a great deal except in the excellence of technic. Our methods are not especially different. These treatments evidently throughout the ages, by all the methods used, were attended with a great deal of success.

Dr. L. E. Moon, Omaha, Nebraska.—It is evident that more progress has been made in hemorrhoidal surgery in the present century than in all previous time. At the beginning of this century, the ligature operation and the clamp and cautery operation were the ones most frequently used. With the general surgeon, the clamp and cautery seemed to be the method of choice, but surgeons who did rectal work especially persisted in doing some type of a ligature operation.

Many did the old classical ligature operation which consisted of dissecting the hemorrhoid from the anorectal line up to its base and then ligating the base with heavy silk and leaving the ligature ends long. The tie was supposed to come away in about ten days, and usually did, but the patient was bedfast for that length of time. Free bleeding at the time of dissection was expected and was usual. In order to prevent this bleeding at the time of operation, someone suggested that the blood supply be tied off before the hemorrhoid was dissected. This was done by placing a buried suture through the upper pole of the hemorrhoid and then making the dissection.

This seemed to me to be the ideal method for doing a hemorrhoidectomy. Its chief exponent in the midwest was Dr. Louis J. Hirschman, who was my preceptor as well as preceptor for many others who are present at this meeting. I used it for many years, but I now find that my method of doing a hemorrhoid operation has gone through an interesting evolutionary change in the last ten years. I observed that occasionally after placing the buried suture and then making the dissection, I had as much free bleeding as if a tie had not been placed. I also found that the patient upon whom this type of operation had been done, frequently had anal stenoses. So I began again a free dissection of the hemorrhoid and then tied the base with No. 2 chromic catgut. As time went on, I began to use No. 2 plain catgut, and now I tie off the base of the hemorrhoid with 00-plain catgut. I find that the patients are having less postoperative pain since I am using finer catgut. There are fewer anal contractures, and the disability period for the patient has been shortened.

I make it a practice never to tie skin tissue; I never suture any hemorrhoid incisions; and I never pull the base of the hemorrhoid down to the skin margin. I rarely place more than one tie for each hemorrhoid, and the usual hemorrhoid operation is completed by placing only four ties. With this evolutionary change that I have gone through, I have come back to the original ligature operation except that I use a light absorbable suture material instead of heavy silk.

SPINAL ANESTHESIA*

WITH SPECIAL REFERENCE TO THE USE OF A PROCAINE-"PONTOCAINE" MIXTURE

By CECIL E. NEWELL, M.D.
Chattanooga, Tennessee

There are only three ways by which a physician can improve any procedure or method: (1) obtain better equipment, (2) benefit by the experience of others, (3) benefit by his own experiences. The object of this paper is to set forth for your consideration the improvements in spinal anesthesia which the writer has gained from all three of the above sources.

INDICATIONS

Before spinal anesthesia is employed, it should be indicated (*Table 1*). This type of anesthesia

INDICATIONS FOR SPINAL ANESTHESIA

(1)	Pulmonary complications
(2)	Patient's request
(3)	Surgeon's choice
(4)	Anesthetist unavailable

Table 1

should not be used indiscriminately. It has more limitations than inhalation anesthesia, so it should not be considered a routine anesthesia. At the Newell Clinic and Hospital, we have found two exceptions to this rule. Spinal anesthesia is used routinely both for the reduction and nailing of fractures of the hip, and in transurethral resection of the prostate gland. In these operations, even though the patient is old and often debilitated, we have found this type of anesthesia to have no equal. One of spinal anesthesia's most heralded indications is for surgery below the diaphragm in patients suffering from pulmonary tuberculosis, "acute colds," and other pulmonary complications, particularly advanced bronchiectasis and severe asthma.

Spinal anesthesia is indicated upon the patient's request for it, unless there is some contraindication to its use.

Spinal is an excellent anesthesia for any prolonged operation upon the abdominal wall, lower abdomen, pelvis, colon, rectum, or lower extremities of an adult, particularly if muscular relaxation is desired.

Among the advantages of spinal anesthesia may be listed those enumerated in *Table 2*.

ADVANTAGES OF SPINAL ANESTHESIA

(1)	Unexcelled muscular relaxation
(2)	No danger of aspiration into lungs
(3)	Relatively small dose of anesthetic drug
(4)	Can be used when lungs are diseased
(5)	No danger of explosion

Table 2

CONTRAINDICATIONS

Contraindications to the use of spinal anesthesia are numerous. The most important ones are enumerated in *Table 3*.

CONTRAINDICATIONS TO SPINAL ANESTHESIA

(1)	Infants and young children
(2)	Minor operations
(3)	Diseases of the spinal cord and brain
(4)	Diseases or trauma of the spine
(5)	Diseases of the lumbar skin
(6)	Marked debility or moribund patient
(7)	Septicemia
(8)	Phobia about spinal anesthesia
(9)	Operations above the diaphragm

Table 3

It is much better to use spinal anesthesia in the absence of an indication than to employ it when it is contraindicated. Complaints or fears of anesthesias, though fewer than formerly, are registered by patients more times against spinal than against other types of anesthesia. It is for this reason that we seldom speak of "spinal anesthesia" to the patient. To them, we usually employ the less familiar term "lumbar anesthesia."

PRELIMINARY MEDICATION

A patient to be operated upon while he is conscious should always be prepared by ade-

*Read in Section on Anesthesiology, Southern Medical Association, Thirty-Ninth Annual Meeting, Cincinnati, Ohio, November 12-15, 1945.

quate preliminary sedation. Our patients who are to have spinal anesthesia usually receive barbiturates, morphine, and atropine as detailed in *Table 4*. Naturally, large people require more sedation. Small or very elderly people should be given less.

MEDICATION PRELIMINARY TO SPINAL ANESTHESIA

(1)	Pentobarbital sodium, 1.5 grain at 8:00 p.m.
(2)	Repeat for sleep, if necessary
(3)	Repeat at 7:00 a.m.
(4)	Morphine 1/4 grain 30 minutes preoperatively
(5)	Atropine 1/150 grain 30 minutes preoperatively

Table 4

FACTORS INFLUENCING THE EXTENT AND DEGREE OF ANESTHESIA

The extent and degree of spinal anesthesia are directly dependent upon the factors listed in *Table 5*. A short discussion of each of these will be made in the order listed:

FACTORS INFLUENCING THE EXTENT AND DEGREE OF SPINAL ANESTHESIA

(1)	Anesthetic agent
(2)	Dose
(3)	Site of puncture
(4)	Volume of solution
(5)	Force of injection
(6)	Size of needle
(7)	Direction of bevel
(8)	Specific gravity of anesthetic solution
(9)	Position of patient during injection
(10)	Position of patient after injection

Table 5

Anesthetic Agents.—Of the numerous anesthetic drugs advocated for spinal anesthesia, procaine hydrochloride ("novocain," "neocaine," etc.) is usually conceded to be the safest. In 1933, Lundy and I[11] introduced the use of a 10 per cent procaine solution (*Fig. 1*) for spinal anesthesia. This solution so simplified the administration of the anesthetic agent that its use has been widely adopted.

Unfortunately, the effect of "novocain" is short-lived. There are other drugs which produce a longer anesthesia, but all of them are considered to be more toxic than procaine.[9] "Pontocaine" (*Fig. 1*) is one of these longer-acting drugs,[1 12] but it has been found to be six times as toxic as procaine when given intravenously and thirteen times as toxic when used subcutaneously.[16] The anesthetic action of "pontocaine," however, is much greater than that of procaine.[20] In fact, the spinal anesthesia produced by "pontocaine" will last 2 or 3 times as long as that produced by 10 times as much procaine. So, "pontocaine" is little, if any, more toxic than procaine.

The onset of anesthesia when "pontocaine" is used is much slower than when procaine is employed. It requires approximately 15 minutes for "pontocaine" to become fixed in the tissues. However, if a procaine-"pontocaine" mixture is used, the onset of anesthesia assumes the speed of procaine, whereas, the duration is prolonged to approximate that of "pontocaine." By the additional dilution with procaine solution, the toxicity of "pontocaine" is still further diminished. For the past 12 years at the Newell Clinic, we have used for spinal anesthesias, a 10 per cent procaine solution mixed with an equal amount of 1 per cent "pontocaine" solution (*Fig. 1*) without a serious complication. This mixture has been so satisfactory that it has become our favorite spinal anesthetic agent. It produces an immediate anesthesia which lasts from 2 to 3 hours and often even longer.

Dosage.—The dose of the procaine-"ponto-

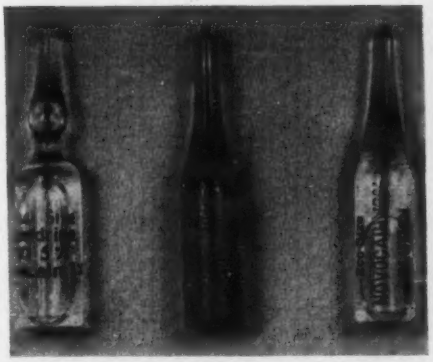


Fig. 1

Ampoules used in spinal anesthesia: 2 c. c. ampoule of 5 per cent ephedrine sulphate solution, 2 c. c. ampoule of 1 per cent solution of "pontocaine," and 2 c. c. ampoule of 10 per cent procaine solution.

caine" mixture is easily calculated, for ordinarily 1 c. c. of the mixture is used for each 100 pounds of body weight. For example, if an abdominal operation were contemplated on a woman weighing 160 pounds, 1.6 c. c. of the procaine-"pontocaine" mixture would be used. She would, thus, receive 80 mg. of procaine and 8 mg. "pontocaine."

For lower, shorter operations, particularly in very elderly persons, it is wise not to use the entire calculated dose (1.0 c. c. per 100 pounds). For example: a short transurethral operation in an 80-year-old man weighing 150 pounds could easily be performed under a spinal anesthesia, in which 1 c. c. (two-thirds of the calculated dose) of the procaine-"pontocaine" mixture was administered. The old man would, thus, receive only 50 mg. of procaine and 5 mg. of "pontocaine."

For a long, high operation in a young patient in good physical condition, the calculated dose might be cautiously exceeded. For example: to free numerous adhesions and repair with fascia a large ventral hernia in the upper abdomen of a girl weighing 135 pounds, one might administer 1.5 c. c. of the procaine-"pontocaine" mixture. This patient would, thereby, receive 75 mg. of procaine and 7.5 mg. of "pontocaine."

We have made it a rule never to exceed a dose of 2 c. c. no matter how heavy the patient or how long the operation.

Site of Puncture.—Spinal puncture can be made for the purpose of introducing an anesthetic agent anywhere from the fourth lumbar interspace up into the thoracic region. The higher the puncture, the higher the anesthetic level will extend (*Fig. 2*), but also the greater the danger of respiratory paralysis or circulatory collapse. For this reason, we usually limit our punctures to the first, second, and third lumbar interspaces. For upper abdominal operations, we use the first, for lower abdomen, the second, and for perineum and lower extremities, we use the third lumbar interspace.

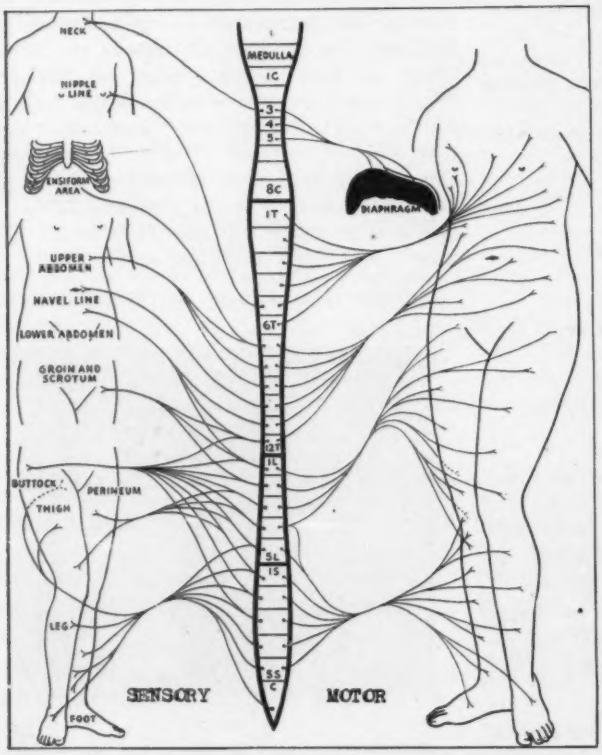


Fig. 2
Anesthetic levels. (From Spinal Anesthesia, Winthrop Chemical Company).

Volume of Solution.—The greater the volume of solution in the syringe, the more spinal fluid will be displaced when it is injected, and the higher the anesthesia will extend. Thus, in upper abdominal operations, we dilute the mixture in the syringe to 4 or 5 c. c. In lower operations, we only dilute to 2 or 3 c. c.

Force of Injection.—The greater the force of injection, the farther the anesthetic fluid will be forced away from the site of injection,[5] and the higher the level of anesthesia will ascend. The use of force in injecting the solution is considered to be dangerous.[10] Barbotage[17] is another means of forcibly dissipating the anesthetic agent in the spinal fluid, so it is also dangerous. For these reasons,

we use a minimal force by keeping the slow and uniform rate of injection of 0.5 c. c. per second, and barbotage is never employed.

Size of Needle.—The smaller the lumen of the needle, the higher the anesthetic level will be if force is used in the injection.[13] We do not have to consider this factor as we never vary the size of the needle and always use the same slow rate of injection. The needle we use is 22 gauge (*Fig. 3*) and has a sharp conical point (*Fig. 4*). One advantage of this needle is that it pierces the dura through a small hole without danger of tearing it. There is less chance, therefore, for postoperative leakage of spinal fluid and headaches.

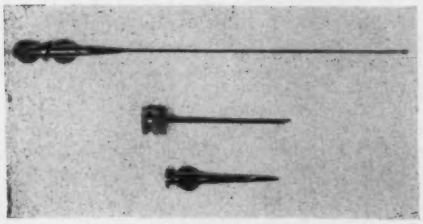


Fig. 3
Useful apparatus for spinal puncture. Above down: Lundy spinal needle (22 gauge), Sise director modified by stilet, and skin punch.

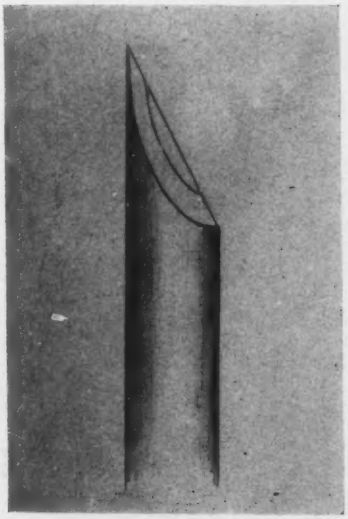


Fig. 4
Drawing of sharp conical point of Lundy spinal puncture needle (X 10).

Direction of Bevel.—If the bevel points up, more of the anesthetic fluid will go up than down. Hence, for upper abdominal operations, we turn the bevel cephalad; for low operations, we turn it caudad.

Specific Gravity of Anesthetic Solution.—The specific gravity of spinal fluids varies from 1.004 to 1.008. The specific gravity of a 1 per cent "pontocaine" solution is 1.0068. When this is mixed with a 10 per cent solution of procaine, it is heavier than most spinal fluids. So when the patient is turned on his back, the procaine-"pontocaine" mixture tends to sink toward the thoracic region because of the natural lumbar curve (*Fig. 5*).

Position of Patient.—The patient is routinely placed on his side to receive spinal anesthesia, unless a saddle type of anesthesia is desired for operations on the prostate or perineum. In these cases, the anesthesia is administered in the sitting position and the patient retains this position for several minutes after the injection. This gives a very intense "saddle anesthesia" often without loss of motor function of the legs.

Position of Patient After Injection.—As has been shown above, the procaine-"pontocaine" solution has a higher specific gravity than most spinal fluids. Furthermore, the "pontocaine" in the mixture does not become fixed in the tissues for approximately 15 minutes. The patient is,

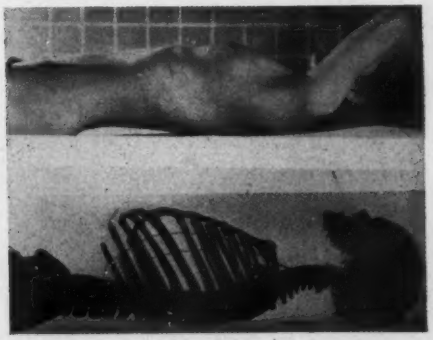


Fig. 5
Photographs of woman and skeleton illustrating the normal lumbar curve. (From Spinal Anesthesia, Winthrop Chemical Company).

therefore, never placed in the Trendelenburg position for at least 15 minutes after injection because the anesthetic mixture might sink by gravity too far up into the thoracic region. Fatalities have been reported from respiratory paralysis[14] when this precaution was neglected.

TECHNIC

After the patient is placed, prepared, and draped, the desired interspace is located. With 3 c. c. of 1 per cent solution of procaine in a 10 c. c. Lundy syringe (*Fig. 6*), a wheal is raised midway between the two spinous processes limiting the interspace selected, injecting only 1 c. c. The wheal needle is replaced by a 50 mm. needle and a sterile ampoule containing 100 mg. of ephedrine is broken and the desired amount of its contents is aspirated into the syringe which still contains 2 c. c. of the original 3 c. c. of procaine solution. Subcutaneous and ligamentous injection is then performed using this procaine-ephedrine solution. The needle is removed and a skin punch (*Fig. 3*), is attached with which a small hole is made in the middle of the wheal. An 80 mm. needle (different length for easy detection) is attached to the syringe, and the contents of the 2 c. c. ampoules containing the procaine and "pontocaine" solutions are aspirated into the syringe. The two solutions are mixed in the syringe by shaking and after the desired dose is calculated, the excess is ejected, and the needle is removed. A Sise director, modified by containing a stilet (*Fig. 3*), is then carried through the hole in the wheal and pushed well into the intraspinous ligament after which the stilet is removed. Thus, a sterile hole, lined by a rigid director, is obtained, and all is prepared for making the puncture. This is easily accomplished with a fine needle, gauge 22, which has the sharp cone-shaped bevel described above. After spinal puncture is made, the stilet is removed from the needle, the syringe is attached and enough spinal fluid is aspirated to make the desired dilution in the syringe. Injection is then smoothly carried out at the rate of 0.5 c. c. each second. About 0.5 c. c. is aspirated at the completion of injection to assure the anesthetist that the tip of the needle is still subdural. If the fluid is aspirated freely, this 0.5 c. c. is reinjected, the needle and

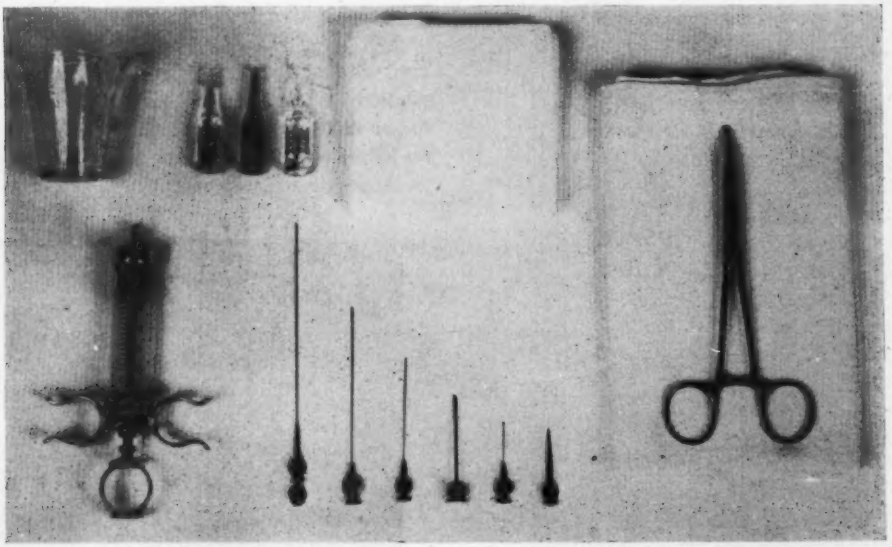


Fig. 6

Tray for the administration of a spinal anesthetic. Above: glass graduate for 1 per cent procaine solution, 2 c. c. ampoule of 10 per cent procaine solution, 2 c. c. ampoule of 1 per cent "pontocaine" solution, 2 c. c. ampoule of 5 per cent solution of ephedrine sulphate and sponges. Below: 10 c. c. Lundy syringe, Lundy spinal needle, 80 mm. needle, 50 mm. needle, modified Sise director, wheal needle, skin punch, towels, and forceps.

director are withdrawn, and the patient is turned on his back. By the time the operative field is prepared and draped, the anesthesia should be sufficient for surgery.

PSYCHIC MANAGEMENT

The results of a spinal anesthesia are often improved if a sympathetic anesthetist who is familiar with the psychologic management of the patient is at hand. He can converse with the patient, make him comfortable, reassure him, and allay apprehension if it develops. The operating team should be quiet and considerate; the handling of the tissue should be gentle; and details of the operation should not be audibly discussed, for these are usually exciting and sometimes gruesome to the patient.

COMPLICATIONS

By far the most frequent complication of spinal anesthesia is a fall in blood pressure.[3] The higher the level of anesthesia, the greater is this drop. Ephedrine sulphate[15] is universally used to counteract this. In our method, we administer ephedrine in the procaine solution with which we anesthetize the tissue prior to the spinal puncture. We employ a 2 c. c. ampoule of a 5 per cent solution of ephedrine sulphate (*Fig. 1*). Thus, each c. c. contains approximately 50 mg. of ephedrine. We usually use from 25 to 75 mg. The lower the blood pressure, and the higher the anticipated level of anesthesia, the larger the dose we employ. Our average dose of ephedrine is 1 c. c. (50 mg.). Ephedrine is never omitted unless the patient has a marked hypertension. A small dose is administered even then if an appreciable drop in blood pressure is noted during operation.

The most annoying complication of any spinal anesthesia is nausea. If the operation is an abdominal one and the patient wretches or vomits, evisceration is apt to occur and often at a most inopportune moment. This experience is so unpleasant for the patient and surgeon that it is long remembered by both. The best prevention of nausea is an empty stomach, adequate preliminary sedation, and the maintenance of blood pressure.[18] Once nausea appears, the inhalation of oxygen or oxygen and carbon dioxide[4 19] is the best remedy. If the blood pressure has noticeably fallen, an additional injection of 25 or 50 mg. of ephedrine is beneficial.

The breaking of a spinal needle in the patient's back is most disquieting[2 6] because of the anesthetist's chagrin and the anxiety of the surgeon, not to mention the medicolegal potentialities. With the use of the director described above, this unfortunate complication is prevented.

Most postoperative headaches following spinal anesthesia are mild. When they are severe, the present day therapy consists of a Trendelenburg position and the frequent administration of ephedrine. This is moderately effective.

Meningitis occurs occasionally following spinal anesthesia. This serious complication can be prevented if in addition to the proper preparation of the lumbar skin, the punch and director described above are used. A sterile hole is thus obtained, and the spinal puncture needle does not puncture skin before it punctures the dura. It should be needless to point out that one should never use spinal anesthesia in a patient with septicemia for fear of introducing the infection into the spinal fluid by the puncture. Suppuration in the lumbar region is a self-evident contraindication to the use of spinal anesthesia.

Respiratory paralysis is one of the most dreaded complications of spinal anesthesia. It is caused by too high an anesthesia and may result in a fatality unless consciousness can be restored by artificial respiration and maintained by some type of resuscitator[2 7 8] until respiration is again voluntarily assumed by the patient. I know of no incidence of this complication when the above described method of anesthesia was employed.

SUMMARY

(1) The method of spinal anesthesia used at the Newell Clinic and Hospital is described.

(2) An anesthetic agent consisting of a mixture of equal parts of a 10 per cent procaine solution and 1 per cent "pontocaine" will produce an immediate and prolonged spinal anesthesia.

(3) The dose of the procaine-"pontocaine" mixture has been found to be approximately 1 c. c. for each 100 pounds of body weight. The maximum dose is 2 c. c.

(4) This mixture has been in our use for 12 years and has been found to be a relatively superior and safe spinal anesthesia even in the aged and debilitated.

(5) Numerous technical details of spinal anesthesia which have been found to be beneficial are described and illustrated.

BIBLIOGRAPHY

1. Adams, R. C.: Recent Advances in Anesthesia. Arch. of Surg., **40**:364-372 (Feb.) 1940.
2. Eversole, U. H.: Anesthetic Emergencies. New England J. of M., **214**:468-472 (Mar. 5) 1936.
3. Goldfarb, W.; Provisor, B.; and Koster, H.: Circulation During Spinal Anesthesia. Arch. of Surg., **39**:429-434 (Sept.) 1939.
4. King, O. C.: Spinal Analgesia. Ann. of Surg., **101**:690-701 (Feb.) 1935.
5. Koster, H.; Shapiro, A.; and Leikensohn, A.: Spinal Anesthesia. Am. J. of Surg., **33**:245-248 (Aug.) 1936.
6. Lahey, F. H.: The Removal of Broken Spinal Anesthesia Needles. J.A.M.A., **93**:518 (Aug. 17), 1929.
7. Lahey, F. H.: Modern Development in Anesthesia and Anesthetists. Sou. Med. J., **31**:29-35 (Jan.) 1938.
8. Lundy, J. S.: Adequate and Properly Controlled Artificial Respiration for Surgical Patients by Means of a New Pulmonary Ventilator. Proc. Staff Meet. Mayo Clinic, **7**:225-228 (April 13) 1932.
9. Lundy, J. S.: Advances in Anesthesia from the Standpoint of the Anesthetist. J.A.M.A., **99**:968-970 (Sept. 17) 1932.
10. Lundy, J. S.: Clinical Anesthesia, 205 pp. Philadelphia: W. B. Saunders, 1942
11. Lundy, J. S.; and Newell, C. E.: Spinal Anesthesia with 10% Procaine Solution; Report of 100 Cases. Surg. Clin. of N. A., **13**:985-994 (Aug.) 1933.
12. Lundy, J. S.; and Tovell, R. M.: Some of the Newer Local and General Anesthetic Agents. Northwest Med., **33**:308 (Sept.) 1934.
13. McCuskey, C. F.: The Selection of the Anesthetic Agent or Method. New Orleans Med. and Surg. J., **85**:1-9 (July) 1932.
14. McCuskey, C. F.: Pantocain as Spinal Anesthesia. Anes. and Analg., **12**:— (May-June) 1933.
15. Ockerblad, N. F.; and Dillon, T. G.: The Use of Ephedrine in Spinal Anesthesia. J.A.M.A., **88**:1135-1136 (April 9) 1927.
16. Runge, H. G.; and Schmidt, H.: Pantocain, ein vollwertiger Kokainersatz. Arch F. Ohren-, Nasen-, u Kehlkopfh., **128**: 232-243 (April) 1931.
17. Sise, L. F.: Spinal Anesthesia for Upper Abdominal Operations. Surg. Clin. of N. A., **11**:345-350 (April) 1931.
18. Stein, J. J.; and Tovell, R. M.: Spinal Anesthesia. Am. J. of Surg., **30**:282-286 (Nov.) 1935.
19. Tovell, R. M.: Spinal Anesthesia. Minnesota Med., **14**: 531-536 (June) 1931.
20. Tovell, R. M.: Spinal Anesthesia. Canadian M. A. J., **28**: 404-409 (April) 1933.

DISCUSSION (*Abstract*)

Dr. John Adriani, New Orleans, La.—The combination of procaine and "pontocaine" is one that has been in use for some time. It seems to have preceded Sise's method of making the solution heavier than the spinal fluid with glucose.

A solution of 20 milligrams of "pontocaine" dissolved in saline or dissolved in water, whichever is preferred, is practically isobaric; that is, it has approximately the same specific gravity as the spinal fluid. Consequently, when injected into the subarachnoid space one does not know exactly where the drug is going, primarily because of the wide variation in specific gravity of the spinal fluid in different individuals. No two people have the same specific gravity.

The addition of the procaine accomplishes two purposes: first, it makes the solution heavier than spinal fluid. Ten per cent procaine is distinctly hyperbaric. Second, it causes anesthesia to come on almost immediately.

These longer-acting local anesthetic drugs, such as "pontocaine" or "nupercaine," require more time for the establishment of anesthesia. With procaine the onset is almost immediate.

I disagree with Dr. Newell on one thing. Dosage should not be estimated by the kilos or pounds of body weight. The important things are the length of the cord and how much cord do we want to anesthetize? How much sensory and how much motor anesthesia are needed? The amount of drug to use will depend upon these factors and not the weight of the patient.

I do not agree with Dr. Newell concerning his views on respiratory failure. It is not the thing I fear most. The thing I fear most is circulatory failure. Certain patients just do not tolerate spinal anesthesia. In these the blood pressure falls to irreversible shock levels.

Patients who have increased intra-abdominal tension are poor risks in this respect. Tension from cysts, large masses, marked distention, or ascites complicates the situation and increases the hazards of spinal anesthesia in these patients.

In compiling mortality figures from spinal anesthesia at Charity Hospital during the past five years, we noted that only one patient died from respiratory failure; seven others died from circulatory failure. Respiratory failure can be prevented when heavier than spinal fluid solutions are used by acutely flexing the head when the patient is inclined. The drug, therefore, gravitates downward and the intercostal nerves may be affected. Unless one employs overwhelming doses, the drug will not pass into the cervical region. As long as the diaphragm which is innervated from the cervical nerves remains active, respiratory failure will not be a problem.

In the event the drug does ascend to the cervical nerves, if one recognizes the complication immediately and institutes artificial respiration, the patient will survive.

In the case which was lost from respiratory failure the surgeon who gave the spinal was not familiar with the method of artificial respiration and the complications of spinal anesthesia. A nurse who was watching the patient failed to watch respiration. Circulatory failure was the first sign of difficulty noticed. It was secondary and was due to the terminal event following the respiratory failure.

In other words, the fact that respiration had stopped was overlooked until it was too late. It is important in spinal anesthesia to watch respiration as well as circulation. However, circulatory failure resulting from the spinal primarily is the thing that I fear most and the one which is the most common cause of death from spinal anesthesia.

Dr. Russell F. Bonham, Houston, Tex.—I would like to take issue with Dr. Newell on one other point which Dr. Adriani did not mention. In the first place, I believe Dr. Newell mentioned indications for spinal anesthesia when the anesthetist was unavailable. I pre-

sume he meant that then the surgeon would give the anesthetic, and if anyone sits with the patient, he did not mention that.

Many men who do surgery have never given a spinal, have never done a spinal puncture. I believe if any spinal anesthesia is required, or any anesthesia, the anesthetist should be there. If the anesthetist does not actually give the spinal, he should at least be there to watch the patient.

There is still another point. Dr. Newell mentioned the case of falling blood pressure, that the patient should have ephedrine. He did not mention how it should be given. I believe if you want to get an immediate effect, it should be given intravenously. Furthermore, I would like to add that I think if you have fallen blood pressure you should always have intravenous glucose or saline or blood at hand to be applied at a given time.

I think it is more beneficial to control the blood pressure with fluids than it is by the drugs. However, the ephedrine or other drugs you want to add can easily be added to the intravenous solution being given.

Dr. Newell (*closing*).—I am glad Dr. Adriani brought out the point regarding the length of the cord. He states that the length of the cord corresponds more closely to height than it does to weight. That is definitely true. The longer the cord, the more distance the anesthesia has to travel, and the lower the level of anesthesia will be. Conversely, the shorter the cord the higher the anesthetic level and the greater the danger of respiratory failure.

As a general rule, however, a person who is six feet tall will weigh more than a patient who is five feet in height, and we have found weight to be a satisfactory and workable index for dosage. We find that one c. c. of our anesthetic mixture per hundred pounds of body weight is effective and is certainly a very simple calculation. Actually, in short fat individuals, who have a marked lumbar curve and a short cord, we are cautious and often reduce the dose. If the patient is unusually tall, the dose may have to be increased particularly for long or high anesthesias.

Dr. Adriani says that he fears circulatory failure more than respiratory failure. When this is a fatal or near fatal collapse, I quite agree it certainly is a most dangerous complication. We have found that if oxygen and ephedrine are given at the first sign of pallor, nausea, quickening of the pulse, or a fall in blood pressure, collapse is prevented. I am glad he stressed the use of epinephrine and intravenous fluids, as these are frequently indispensable.

Dr. Bonham brought up the question of whether an anesthetist being unavailable is an indication for spinal anesthesia. Before Pearl Harbor, this would not have been included as an indication. It is only because of the present shortage of anesthetists that this deplorable situation has forced itself onto our list of "indications for spinal anesthesia." I hope that soon we can take it off.

ABERRANT PANCREAS IN THE DUODENUM*

By JACK C. NORRIS, M.D.†
Atlanta, Georgia

During 1944, at necropsy performed upon the body of a well-developed, well-nourishd male of twenty-seven years, a tumor was found in the wall of the duodenum, situated at a point seventeen centimeters from the pyloric junction. It was dome-shaped, slightly ovoid, and measured 2 x 1.5 centimeters; was fairly firm to the touch and when viewed beneath the serosal surface of the intestine, it appeared to have a spotty, greyish texture, and when incised, seemed to be a granular, greyish-yellow growth of a thinly separated, lobulated type, quite typical of pancreatic tissue.

For several reasons it was felt that this tumor was worth reporting, not only because we make an addition to the statistical number of tumors previously reported, but also on account of the general interest which has been shown in such lesions in the last few years. It also is a tumor of considerable rarity, and of physiologic, surgical and clinical importance.

OCCURRENCE AND ETIOLOGY

These rare growths are found more often in the duodenum than elsewhere.[1] They have also been observed in the walls of the stomach, jejunum, and ileum and about the pancreas frequently. In a series of 257 duodenal lesions, other than ulcers studied by A. O. Whipple,[2] only 13 primary tumors were found, and of these, three were heterotopic pancreatic in type. The latter number found by that investigator indicates the rarity of such lesions. The authors, based upon a large number of autopsies performed over a period of years, can also testify to the paucity of the lesion.

The etiology of these tumors must be assumed to be the result of growing aberrant cell

*Received for publication November 23, 1945.

†Captain, Medical Corps, U. S. N. R., U. S. Naval Hospital, Brooklyn, New York.

*The opinions or assertions contained herein are the private ones of the writer and are not to be construed as official or reflecting the views of the Navy Department or the naval service at large (Art. 113 (2) U. S. Navy Regulations).

rests, probably biologically accidental; however, it cannot be denied that nature might permit these growths to occur in an attempt to insure adequate function of an insufficient pancreas. In this patient, the pancreas was small, measuring 12 cm. in length. It did not show any other indication of disease.

CLINICAL FEATURES

These tumors are of clinical importance for several reasons: first, they may become the source of malignancy;[3] secondly, they may be the cause of hyperinsulinism and hypoglycemia; and thirdly, they are frequently the source of epigastric pain and may produce colicky symptoms that are frequently mistaken for duodenal or gastric ulcerations; and finally, they may eventually become the site of intestinal hemorrhages, due to erosive destruction of the intestinal mucosa.

A fairly typical case history would be a patient who complained of epigastric distress of a colicky nature which was progressive in type, and whose symptoms had continued for a long period, with a normal or low-normal blood dextrose, in whom no detectable ulceration or tumor had been discovered by x-ray or other diagnostic methods. The patient might be considered a neurotic, or every disease, such as ulcers, appendicitis or cholecystitis, might be suspected. The final diagnosis is disclosed only by surgical intervention, but unless the surgeon were particularly on guard, the lesion might be overlooked. If the tumor were large enough and active enough, distinctive attacks of nervousness and weakness associated with hypoglycemia, should also make one strongly suspicious of such a lesion's existence.

Fig. 1
Tumor, viewed through serosa.

Fig. 2
Tumor, as seen in gut lumen.

HISTOLOGIC FEATURES

These pancreatic processes range in size from very small macroscopic nodules to fairly large tumors. This one, as above indicated, measured 2 x 1.5 cm. in diameter. Microscopically, it was a well-organized local reproduction of pancreatic tissue, situated just beneath the duodenal mucous membrane. It was composed of pancreatic acini, interlobular connective tissue, and islands of Langerhans. Excretory ducts were present, and the blood supply was orderly. At various points, muscle mixed with nerve and connective tissues extended among the lobulations. Between the pancreatic structures and the duodenal mucosa, there were large spaces containing a faintly staining acidophilic fluid which could have been pancreatic juice; but was, on the other hand, more probably a local edematous fluid. There was no evidence of infection; however, the superficial duodenal mucosa was chronically diseased and was undergoing pressure atrophy and con-

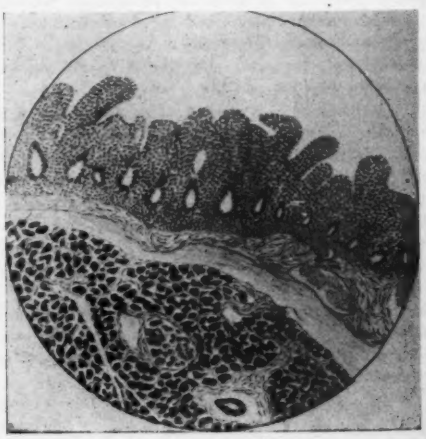


Fig. 3
Photographic reproduction of histologic section.

gestion. Eventually the tumor, in addition to the clinical disturbances which it had probably caused the patient, would have produced local ulceration and hemorrhage.

Unfortunately, we know nothing of the patient's related clinical complaints prior to death. The man died of gunshot wounds which had produced severe injuries in various parts of his body. Before death, his blood chlorides and total proteins were normal, and dextrose was not present in his urine.

BIBLIOGRAPHY

1. Cecils, R. L.; Ochsner, A.; and DeBakey, M. E.: Textbook of Medicine. 6th Edition. Philadelphia: W. B. Saunders Company, 1943.
2. Christopher, Frederick: Textbook of Surgery. 3rd Edition. Philadelphia: W. B. Saunders Company, 1943.
3. Ewing, James: Neoplastic Disease. 4th Edition. Philadelphia: W. B. Saunders Company, 1941.

THE PREVENTION AND CONTROL OF DISTURBANCES OF PROTEIN METABOLISM IN ROCKY MOUNTAIN SPOTTED FEVER*

THE VALUE OF FORCED FEEDINGS OF A HIGH-PROTEIN DIET AND OF THE ADMINISTRATION OF SPECIFIC ANTISERUM

By GEORGE T. HARRELL, M.D.,
WILLIAM A. WOLFF, PH.D.,
WILLIAM L. VENNING, M.D.,
and
JOHN B. REINHART, M.D.
Winston-Salem, North Carolina

Previous observations on rickettsial spotted fever in this hospital have shown that peripheral circulatory collapse may occur in patients who are severely ill with the disease.[1] The circulatory collapse follows a lowering of blood proteins and is frequently accompanied by edema. The vascular damage caused by rickettsial invasion of the endothelial and smooth muscle cells of small blood vessels apparently increases the leakage of fluid into the tissues.[2] The administration of crystalloids, glucose or saline, may aggravate the protein loss and increase the edema by washing additional protein out of the circulation. In most instances the circulatory collapse and edema can be controlled by the intravenous administration of preformed protein in the form of whole blood or plasma.

No chemotherapeutic agent has yet been developed which will kill the organisms after they are established in cells, and chemotherapy would therefore be most effective early in the course of the disease.[3] Since antiserum has been found to be less effective after the first three days of rash, the treatment of more advanced cases is largely supportive.[4] In view of the previously recognized disturbance in protein metabolism, a diet high in protein would appear to offer a logical means of supporting the patient. The present study was undertaken to determine the extent to which protein disturbances could be prevented or corrected if (1) a high protein intake was forced from the beginning of therapy, and (2) in addition, a potent specific antiserum was administered to those patients seen before the third day of rash.

EXPERIMENTAL STUDY

Material

The present study was done on 9 children treated in this hospital for Rocky Mountain spotted fever during 1945. They were fed a basic high-protein diet supplemented with feedings of a high-protein liquid, which was given by gavage if necessary. The details of the diet and the method of administering the supplement are discussed elsewhere from a dietetic point of view.[5] The results obtained in these patients were compared with those obtained in 8 children with Rocky Mountain spotted fever who were treated here in previous years. The patients in this control group were given a standard pediatric house diet supplemented with oral feedings of liquids high in caloric value.

As is shown in *Table 1*, the two groups of

---

*Read in Section on Pediatrics, Southern Medical Association, Thirty-Ninth Annual Meeting, Cincinnati, Ohio, November 12-15, 1945.

*From the Departments of Medicine, Pathology and Pediatrics of the Bowman Gray School of Medicine of Wake Forest College and the North Carolina Baptist Hospital, Winston-Salem, North Carolina.

*This study was aided by a grant from the John and Mary R. Markle Foundation.

*Antiserum was furnished by Lederle Laboratories, Pearl River, New York, through the courtesy of Dr. Herald Cox. Supplies of purified plasma albumin were furnished by Dr. Charles A. Janeway, Department of Pediatrics, Harvard Medical School, Boston, Massachusetts, and by the Blood and Plasma Department, Naval Medical School, National Naval Medical Center, Bethesda, Maryland. Protein hydrolysate (amigen) was furnished by Mead Johnson & Company, Evansville, Indiana.

cases were comparable in clinical severity. The average duration of the disease on admission, as measured by the time which had elapsed since the rash appeared, was two days greater in the control than in the test group.

CLINICAL SEVERITY OF THE DISEASE

Group	Mild	Moderate	Severe	Fatal	Total
Control	1	3	2	2	8
Test	2	3	3	1	9

Table 1

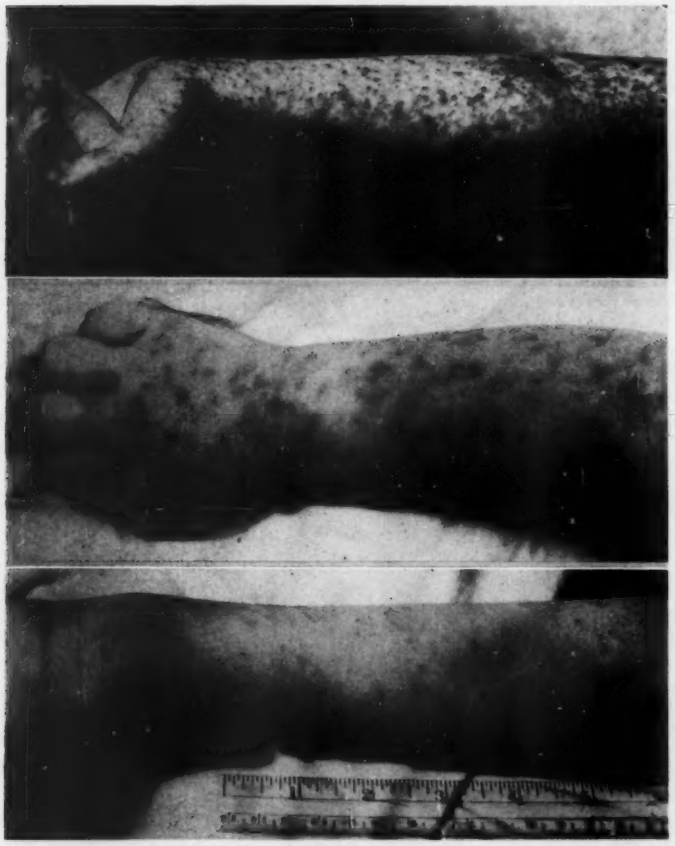


Fig. 1

Effect of Specific Antiserum on Rash

Top: Girl, age 7; rash present 11 days; severe case not treated with serum.

Middle: Boy, age 4; rash present 11 days; severe case treated with serum on second day of rash.

Bottom: Boy, age 10; rash present 10 days; mild case treated with serum on second day of rash.

The serum-treated cases show fewer spots, less hemorrhage, and less erythema.

Method

In our previous studies, the importance of accurate quantitative measurement of the dietary protein intake had not been appreciated. Patients in the control group had been allowed to select foods which they would eat. The protein intake was estimated as carefully as possible from the diet sheets, the nurses' notes, and the hospital record. Patients in the test group were provided with a diet high in proteins, calories and vitamins immediately after admission. On the basis of preliminary studies of nitrogen excretion, the diet was planned to contain approximately twice the amount of protein provided by the standard pediatric diet. Every attempt was made to induce the patient to take the basic diet. If, because of delirium, coma or uncooperativeness on the part of the patient, the desired protein intake was not achieved, the diet was supplemented or replaced by gavage feeding of a special formula which was high in protein, high in carbohydrate, and very low in fat. The dietary intake was accurately recorded by a dietetian participating in the study, on a chart devised for this purpose. Meat, fish, chicken, cheese, gelatin, and casec were weighed; the protein contained in cereals, milk, fruit, eggs, and vegetables was estimated. From these values the total protein intake was accurately computed. Amino acids were kept in reserve to be administered if orally ingested protein was not utilized.

Studies of the albumin-globulin ratio and urinary nitrogen excretion were made at three periods in the course of the illness: (1) early, as soon after admission as possible, usually by the second day; (2) at the clinical peak, which usually occurred in the second week of the disease; and (3) during convalescence, just prior to the patient's discharge from the hospital, or occasionally on a return visit. During these three periods complete urine collections were made for twenty-four to seventy-two hours. At the mid-point of the collection period, a specimen of fasting blood was drawn, and determinations of the nonprotein nitrogen, the total serum proteins, the albumin-globulin ratio, and the urea nitrogen were made. The total serum proteins and the albumin-globulin ratios were determined by the Kjeldahl digestion method; between the three test periods the total serum proteins occasionally were measured by the falling drop method. The nitrogen content of the urine was determined by the Kjeldahl method and the urea nitrogen content by the urease method. From these values, the urea clearance and the amount of protein metabolized were calculated.

To support the circulation, whole blood or plasma was administered to the control group. In the test group, if support of the circulation was required, purified human albumin was given. This has less nutritional value than whole blood or plasma.

Specific antiserum was administered intramuscularly in the recommended single full therapeutic dose (1.0 c. c. per kilogram) to 4 patients in the control group and 4 in the test group. Our later experience suggested that 3 of the 4 patients in the control group who were treated with antiserum had received it too late to be of any benefit; the other received an inadequate amount.

Results

Clinical Course.—The test group of patients receiving the high-protein diet appeared to have fewer toxic symptoms, fewer neurologic manifestations, less necrosis of the skin, and less edema than did the control group. Only 2 patients in the test group showed easily demonstrable edema, as contrasted with 6 patients in the control group (*Table 2*). The decrease in neurologic manifestations in the test group may have reflected a decrease in the severity of cerebral edema. The amount of preformed protein required for support of the circulation was considerably less in the test group than in the control group (*Table 2*). The patients were more cooperative than those treated in previous years, and ate better. Almost without exception the patients receiving supplemental feedings gained weight during the course of their illness.[5] In the control group no instance of weight gain had been observed; in previous years weight losses of as much as 15 pounds had occurred in older children with Rocky Mountain spotted fever.

The toxic symptoms, such as headaches and muscular aches, were diminished by the administration of antiserum. The rash usually faded or changed in character after serum therapy (*Fig. 1*). Since only one injection of serum was given, the decrease in toxic symptoms was transient and usually lasted only one to two days.

Serum Proteins.—At the early period of study, the total serum proteins and the albumin-globulin ratios were approximately the same in both groups. These determinations were usually done too early in the disease for disturbances in the protein levels to be expected. At the clinical peak of the disease, the average values for total serum proteins in the test group remained at slightly higher levels than those in the control group. This difference was noted in both the albumin and globulin fractions. During convalescence the serum proteins in each group returned essentially to normal; the final levels in both groups were higher than on admission.

Since clinical observation showed the critical period in those patients who survived an initial overwhelming infection to be the twelfth to

Group	Number of cases			Preformed protein given		
	Total	Serum Treated	Edema	Early	Peak	Convalescence
Control	8	4*	6	5	3	2
Test	9	4	2	1	3	0

*Serum was administered late to three patients and in inadequate amount to the fourth.

Table 2

fourteenth days of rash, the data were also analyzed with the peak of the disease arbitrarily defined as the tenth to the sixteenth days of rash. All values obtained before the tenth day were classified as early, and all those obtained on the seventeenth day or later, as convalescent. Data arranged in this arbitrary fashion did not differ essentially from the data arranged according to the clinical course of the patient.

Urinary Nitrogen.—Of greater significance than the levels of the protein fractions in the blood may be the maintenance of tissue protein. The balance in tissue proteins is reflected by serial determinations of the nitrogen excretion, especially the values obtained during convalescence. For various reasons it has been impossible to make such determinations systematically in all of our cases. Especially in the control group, data are scarce and incomplete. For this reason sample serial determinations on 1 patient of the control group and 2 patients of the test group (one treated with antiserum, the other without) are presented in *Table 4*. It is apparent that in these last patients, in contrast to the one in the control group, nitrogen was retained during the peak of the disease, whereas during convalescence the excretion exceeded the intake. This finding may suggest that in the patients whose intake of protein was high during the course of the disease the tissue proteins were not so greatly depleted as in the patients of the control group. In some patients from both groups the nitrogen excretion exceeded the intake at some time during the disease, and in all patients the nitrogen excretion was greater than would be expected during health.

SERUM PROTEIN LEVELS, GRAMS PER CENT

Group	Early			Peak			Convalescence		
	Total	Alb.	Glob.	Total	Alb.	Glob.	Total	Alb.	Glob.
Control	5.1	2.9	2.1	4.3	2.0	1.8	6.4	3.4	2.9
Test	5.1	3.2	2.0	5.0	2.6	2.6	6.0	3.2	2.8

The values are the average of all cases in each group. The total value for serum proteins does not always equal the sum of albumin and globulin, since the ratio was not determined in each case at every period. Because of the small number of cases and the magnitude of the variations in each group, the figures are not statistically significant.

Table 3

DISCUSSION

Rickettsial spotted fever is a sporadic disease the virulence of which varies in different localities, and from year to year in the same locality. It is difficult to obtain each year even a small series of cases of the disease and for various reasons, to do a complete detailed study in each case. The accumulation of sufficient data to prove statistically each point would require many years. We have presented these tentative data for their suggestive value, since they are in general agreement with the theories of the altered physiology of the disease which we have held, and since our clinical observations have appeared to confirm the usefulness of a high-protein diet in the treatment of this disease. We are not attempting to draw definite conclusions; the comparison of the test group with a control group of patients treated in different years and studied less intensively may be deceiving. We hope that others will adopt the methods of study we are proposing and will critically examine the results of treatment.

Diet

Little is known about the relation of protein requirements to the extent and duration of fever, and authorities are not in agreement as to the necessity for increasing the protein intake as well as the intake of calories in patients with severe, long-standing infections.[6,7] We believe that the protein intake must be increased and that a high-protein diet should be started immediately upon initiation of therapy in order to compensate for such depletion of tissue proteins as may have already occurred, to correct the tendency to hypoproteinemia, and to protect the liver from damage. In spite of the limited number of patients and the incompleteness of the studies, our data appear to be in line with current concepts of pathologic physiology. On the basis of our studies on the urinary nitrogen excretion, it seems that the daily requirement for protein in rickettsial spotted fever must be in the range of 3-4 grams per kilogram. The protein taken in the diet appeared to be utilized, and the presence of edema did not seem to interfere with digestion or absorption of protein; parenteral administration of amino acids was not necessary in any of the cases in the test group.

The degree of clinical improvement observed in the patients maintained on a high-protein diet was more striking than the increase in the blood proteins. Although there were some instances of peripheral circulatory failure in the patients on the high-protein diet, the amount of albumin, plasma, or blood required for support of the circulation was less than that in the control group. Purified human albumin proved to be very effective for this purpose; it has the advantage of requiring a smaller volume of fluid for injection than does plasma, and carries less salt and citrate. Furthermore, the albumin fraction of the serum proteins is known to be the one of greatest importance.[8] The smaller molecule of albumin has a greater water-binding power (colloid osmotic activity) than does the globulin fraction, and hence better maintains blood volume and prevents extra-vascular edema. The maintenance by the high protein diet of serum proteins, particularly the albumin fraction, at the peak period may be more striking than the values indicate, since less preformed protein was administered to the patients in the test group during the early period; more blood proteins appear to have been formed from food.

EFFECT OF HIGH PROTEIN DIET ON PROTEIN METABOLISM

		Phase of Illness	Date	Dietary Intake of Protein	Urinary Nitrogen Excretion Calculated as Protein	N.P.N.	T.S.P.	Alb.	Glob.	A/G
				Gm./kilo/day	Gm./kilo/day	mg. Per Cent	Gm. Per Cent	Gm. Per Cent	Gm. Per Cent	
CONTROL			6-15-44			34	6.0	4.2	1.8	2.3
	7-year-old male	Early	6-16-44	1.4†		44	5.2	3.2	2.0	1.6
	Rash present 1 day		6-17-44			31	4.9			
			6-19-44				5.7			
	22 kilograms	Peak	6-23-44	1.9†	2.23	33	4.9	3.2	1.7	1.9
	Treated with antiserum*		6-24-44				4.9			
		Convalescence	6-29-44	2.0†	1.77	24	6.1	3.2	2.9	1.1
TEST	6-year-old female	Early	7-19-45	4.0		39	3.9			
	Rash present 7 days		7-21-45	4.0		30	5.0			
		Peak	7-23-45	6.0	1.45	27	5.1	3.0	2.1	1.4
	21 kilograms		7-25-45	8.0	2.95	25	5.0			
		Convalescence	7-27-45	1.1‡		30	6.7	3.1	3.6	0.8
	No antiserum		7-31-45	3.0	3.67	30	5.7	2.7	2.6	1.1
		Early	7-20-45	0.9		20	6.2			
	5-year-old male		7-23-45	0.8	1.24	28	6.5	3.7	2.8	1.3
	Rash present 1 day	Peak	7-26-45	4.0	2.40	30	5.7	3.6	2.1	1.7
			7-27-45	8.0		33	5.7			
	17 kilograms		7-30-45	8.0			4.2			
			7-31-45	8.3			5.2			
	Treated with antiserum	Convalescence	8-2-45	9.0	9.92		5.5			
			8-4-45	8.8			5.6			
			8-6-45	8.6		50	6.1	3.2	2.9	1.1

*One-third therapeutic dose.
†Estimated.
‡Gavage feeding discontinued.

Table 4

Serial determinations of the blood volume indicated that the volume decreased during the peak period of the disease and returned to normal during convalescence. The absolute values for circulating proteins must be interpreted in the light of these alterations, for the total quantity in grams circulating at any period may be altered by loss of fluid, though the quantity per unit of blood is changed relatively little. Small changes in blood proteins may bear little quantitative relation to changes in tissue proteins and should be interpreted with caution.

It is highly probable that the levels of blood proteins do not accurately reflect the state of all proteins in the body, since the body apparently maintains the circulating proteins at the expense of any available store. At the present time the tissue stores cannot be directly measured, but depletion of these stores is indicated by an indirect method such as the retention of nitrogen from dietary protein and failure to excrete excess dietary nitrogen in the urine. The high levels of dietary protein intake necessary to reverse the trend in the urine from nitrogen retention during the peak of the disease to excretion during convalescence suggest that the depletion may be great.

The nonprotein nitrogen in both groups of patients was seldom elevated after the initial dehydration was corrected. The ability of the liver to deaminize amino acids, as judged by the values for nonprotein nitrogen, does not appear to be impaired. When the daily protein intake reached levels of 6 grams per kilogram of body weight, occasional transient rises in the nonprotein nitrogen were observed. Since urea clearance tests showed that the rise was not due to a decrease in urinary function, it was interpreted as simple overloading of the kidney. In one patient, when the daily protein intake was 9.0 gm. per kilogram, the nonprotein nitrogen was 50 mg. per 100 c. c. and the urea clearance 150 per cent of normal (*Table 4, Case 3*).

Antiserum

Specific antiserum administered early in the disease in a single dose of 1 c. c. per kilogram of body weight temporarily lessened the clinical severity of the disease and reduced toxic symptoms. Since beneficial results were transient we believe that better results could be obtained by repeating the dose every second or third day for a maximum of three doses, provided the first dose is administered before the third day of rash. The initiation of antiserum therapy after the third day of rash caused little improvement.

Since no patient in the control group received ideal serum treatment, no basis exists for controlled comparison and hence no conclusions can be drawn regarding the effectiveness of antiserum in preventing alterations in protein metabolism.

No edema was observed in the patients of the test group who were treated with antiserum. We do not know whether the serum prevented vascular damage and leakage of protein into tissue spaces, or whether the high-protein diet was a greater factor. The fact that the rash was markedly altered in some instances by serum therapy may indicate a lessening of vascular damage (*Fig. 1*). Even in patients with adequate protein intake, however, the administration of antiserum did not prevent alterations in the total serum proteins and the albumin-globulin ratio.

In the test group the blood protein values were slightly higher in patients who received antiserum than in those who did not. This finding should be interpreted with caution, however, since the patients who received no serum had been ill an average of seven days longer than the serum-treated patients at the time of the initial studies. The serum-treated group was also followed for nearly three weeks longer before the final studies were made, and hence would be expected to show a greater degree of improvement.

SUMMARY

(1) The administration of a high-protein diet appears to have definite value in the therapy of rickettsial spotted fever. The daily protein requirement seems to be in the range of 4 gm. per kilogram of normal body weight; if this level is not obtained with a basic diet, supplementary feedings of a high-protein liquid should be given by gavage if necessary.

(2) In 9 pediatric patients with rickettsial spotted fever treated during 1945 with a high protein intake, the amount of edema and the amount of preformed proteins required for sup-

port of the circulation was reduced. Although blood protein levels, especially the albumin fraction, were only slightly better maintained, there appeared to be less depletion of body proteins, as measured by studies of the urinary nitrogen excretion.

(3) A potent specific antiserum seems to be useful in controlling the toxic symptoms, if administration is begun before the third day of rash. It is suggested that repeated full therapeutic doses be given daily or at two-day intervals, rather than the single injection which has been previously recommended.

(4) The administration of specific antiserum, under the conditions of this experiment, did not prevent alterations in protein metabolism, even in patients receiving an adequate protein intake.

REFERENCES

1. Harrell, George T.; Venning, William; and Wolff, William A.: The Treatment of Rocky Mountain Spotted Fever, with Particular Reference to Intravenous Fluids. A New Approach to Basic Supportive Therapy. J.A.M.A., **126**:929-934, 1944.
2. Harrell, George T.; Wolff, William A.: A New Approach to Basic Supportive Therapy in Rocky Mountain Spotted Fever. Sou. M. J., **38**:367-371, 1945.
3. Rose, Harry M.; Duane, Richard B.; and Fischel, Edward E.: The Treatment of Spotted Fever with Para-Aminobenzoic Acid, J.A.M.A., **129**:1160-1161, 1945.
4. Topping, Norman H.: Rocky Mountain Spotted Fever. Further Experience in the Therapeutic Use of Immune Rabbit Serum. Pub. Health Rep., **58**:757-775, 1943.
5. Dingledine, Mary Jane; Willis, Carolyn; and Harrell, George T.: High Protein Diets in the Therapy of Rocky Mountain Spotted Fever. J. Am. Dietet. A., **22**:389-391, 1946.
6. McLester, James S.: Nutrition and Diet in Health and Disease, 3rd Edition, Ch. 22. Philadelphia: W. B. Saunders Company, 1940.
7. DuBois, Eugene F.: Basal Metabolism in Health and Disease, 3rd Edition, Ch. 18. Philadelphia: Lea & Febiger, 1936.
8. Elman, Robert: Protein Metabolism and the Practice of Medicine. M. Clin. North America, 303-313 (March) 1943.

DISCUSSION (*Abstract*)

Dr. W. F. Burdick, Washington, D. C.—In Washington at the Children's Hospital over a period of fifteen years, we have had 47 of these cases.

We have stressed in the care of these patients first of all, early diagnosis so that they may receive the benefit of serum. Secondly, we have tried to confirm this diagnosis later with the specific complement fixation test. We have stressed good nursing care, which consists of complete rest and quiet.

We try to get into these patients an adequate fluid intake. They usually, in our experience, have taken fluids by mouth very, very well. They are thirsty, and will usually drink enough. If they do not take enough by mouth, we have given them parenteral fluids, seeing that they get from 20 to 40 c. c. of fluid per kilogram of body weight per 24 hours.

We further have given them a high protein diet, attempting to get in at least 2½ to 3 grams of protein per kilogram of body weight per day. The patients who are very ill do not take it very well by mouth, so we use the gavage tube over a period of two or three days until they get by the stormy time and then they take it very well by mouth usually.

Since 1930 in Washington, we have had some 47 cases at the Children's Hospital of Rocky Mountain spotted fever. We have summarized our results in those cases from 1930 to 1940. Drs. Ong and Raffetto reported in the *Journal of Pediatrics* a series of 18 cases up to that time, 15 of which had uneventful recoveries and 3 of which died. Since that time, we have had 29 cases of Rocky Mountain spotted fever and 2 have died. We have a case fatality rate of 16.6 per cent.

I think we might comment briefly on the deaths because we will probably learn more from our patients who die than we do from those who get well. The first case in that series was back in 1930. It was our first case at the Children's Hospital and I believe one of the first cases recognized as Rocky Mountain spotted fever in the East. Up to that time, it was thought to exist only in the Rocky Mountain area.

This little fellow was rather unfortunate. He came into the hospital complaining of acute abdominal pain and headache. This was several days before his rash appeared. He showed right rectus muscle rigidity. His leukocytes were some 12,000 with 94 per cent polymorphonuclears. The diagnosis of acute appendicitis was made, and his appendix was removed. Two days later he broke out with a rash which was confirmed by the United States Public Health authorities as Rocky Mountain spotted fever, our first case in that area. He died on the ninth day. The point about that case, I believe, is that Rocky Mountain spotted fever patients bear surgery poorly.

The second case in that series to die was a patient complicated with hemolytic streptococcus anemia. She died on the twenty-sixth day.

The third case to die in that series was a patient who came to us at the Children's Hospital on the fourteenth day of illness. That patient died 30 hours after admission to the hospital.

The total number of additional cases from 1940 to 1945 was 29, with 27 recoveries, uneventful, and 2 deaths, giving us a case fatality rate of 6.89.

To comment on those two deaths, the first one was a patient who was diagnosed by the family physician as having a severe case of German measles, with a complicating bronchial pneumonia. That patient received sulfapyridine over a period of 2 days and then the diagnosis was confirmed of Rocky Mountain spotted fever.

I think the point about that one is that these patients bear the sulfa drugs very poorly, and their use is contraindicated in Rocky Mountain spotted fever.

The next case was that of a Mongolian idiot who was fortunate or unfortunate enough to develop Rocky Mountain spotted fever and promptly died. Those patients, I believe, bear infection of any kind rather poorly.

Therefore we have a grand total of 47 cases, 42

recoveries and 5 deaths, giving us a case fatality rate of 10.63. That fatality rate is rather low as compared to Topping's figures of 12 per cent. The overall mortality rate throughout the United States is supposed to be about 12 per cent in children up to 15 years of age.

Probably if we had 1,400 cases, as Topping had, our mortality rate would be 12 per cent, too.

It is to be hoped that this mortality rate may be further lowered by such investigations as we have heard reported.

Dr. J. G. Van Dermark, Covington, Ky.—Dr. Harrell's studies on the pathological physiology of Rocky Mountain spotted fever offer a new approach to rational therapy of this disease. Those of us who have seen several of these patients die are struck by the fact that most of them die in peripheral vascular collapse and all of them exhibit a generalized edema which is sometimes quite marked.

Dr. Harrell has showed that both of these conditions may be the result of the low serum protein found at the peak of the disease and that the vascular collapse may be helped by intravenous administration of albumin, plasma or whole blood, and that this may be maintained by forced feeding of a high protein and high carbohydrate diet. This is a real advance in the therapy of the disease.

In reading the literature on the treatment of spotted fever, there is a universal condemnation of intravenous therapy. However, we have treated several patients in collapse with blood transfusion and there was a striking improvement in their general condition and particularly in their circulation.

Dr. Harrell has given us a sound physiological basis for this therapy and it is hoped that the previous high mortality in these patients may be considerably lowered.

Miss Mary Jane Dingledine, Winston-Salem, N. C.—On the basis of the previous years' work, a diet containing 2.5 to 3.0 grams of protein per kilogram of normal body weight was offered. We devised a chart for recording the protein intake; during the period of intensive study servings were accurately weighed and measured, and only food actually consumed was recorded.

When the patient's temperature was high or he was irrational, the basic diet was supplemented daily by 1,000 c. c. of a high-protein liquid formula given in four between-meal feedings. The supplement was made up of skimmed milk, powdered milk, and corn syrup. Because of the liver damage which is known to occur in Rocky Mountain spotted fever, the use of whole milk was avoided in order to keep the fat intake low. The corn syrup was used as a source of carbohydrate and to give sufficient calories.

Since the mixture thickened upon refrigeration, it was warmed to body temperature before being offered to the patient. If it was refused, chocolate syrup was added; this gave an appreciable increase in carbohydrate, but a negligible increase in fat. The consistency and flavor were those of chocolate malted milk, and the mixture was not undesirable to take by mouth. If it was twice refused, the patient was given the choice of having a gavage tube passed or of drinking the mixture; we had only a few instances of refusal to drink it. The supplementary feeding was discontinued during convalescence when the protein intake from the basic diet was sufficient for the patient's needs.

Accessory vitamins were given in the form of proprietary vitamin preparations. In checking the intake of vitamins against normal requirements at the end of the period of study, we were surprised to find that thiamin had been given in excess but that nicotinic acid had been given in insufficient amounts. This error was due to a change in the formula of one of the proprietary preparations on May 1, 1945. In next year's work, the quantities of these vitamins will be adjusted.

SELECTIVE RADIATION OBTAINED BY THE INTRAVENOUS ADMINISTRATION OF COLLOIDAL RADIOACTIVE ISOTOPES IN DISEASES OF THE LYMPHOID SYSTEM*

By P. F. HAHN, Ph.D.

and

C. W. SHEPPARD, Ph.D.

Nashville, Tennessee

INTRODUCTION

A major advantage of therapy with artificially radioactive isotopes is that a judicious choice of chemical elements is permitted, and through proper selection radiation may be localized in certain parts of the body. Iodine is selectively taken up by the thyroid. On this basis, treatment of Graves' disease has been carried out by groups in Boston[8] and Berkeley.[6] Radioactive strontium has been shown by Pecher[13] to behave in the body very much like calcium. This element is preferentially taken up by rapidly growing bone tissue. It is found that it is accumulated in the epiphyseal regions and at the site of fractures. Thus the therapy of sarcomata of the bone with radioactive strontium is suggested. It is chosen mainly because of the pres-

*Received for publication January 13, 1946.

*From the Department of Biochemistry, Vanderbilt University School of Medicine.

*This work was carried out in part under a grant from the Nutrition Foundation.

ent difficulty in producing therapeutic amounts of radioactive calcium. When soluble, ionisable salts of phosphorus are administered either by vein or by mouth, they are temporarily concentrated in the liver. They later spread throughout those tissues of the body which normally accumulate phosphorus and are ultimately concentrated, to some extent, in the bony structures.[15] Radioactive phosphorus is easily made in large quantities and is a convenient element with which to work. For these reasons, many investigators have employed it in an attempt to treat such conditions as polycythemia, myelogenous leukemia, lymphogenous leukemia, and lymphoma. It is evident that due to its biological behavior, the use of radioactive phosphorus is favored primarily in the first two of these conditions. Prolonged remissions in polycythemia vera have been produced and promising results have been obtained in the treatment of chronic myelogenous leukemia.[2 5 7 10 11 14 16]

It is evident that radiation therapy of any kind is a dangerous tool in inexperienced hands. Its use is contraindicated where better methods of control of disease are available. In the control of thyrotoxicosis, surgery and thiouracil might meet with more favor and be more safely applied than radioactive iodine at this time. Similarly, the physician who has not had much experience in the use of radioactive phosphorus will be much more inclined to control polycythemia vera by phlebotomy. However, where facilities for the use of radioactive phosphorus are available, the fact remains that it is probably superior to x-ray therapy, due to the absence of radiation sickness as an attending complication. Most will agree that it is also far superior to the use of hydrazine derivatives. Here a considerable amount of red cell debris is liberated in the vascular system over a short space of time, and danger of thrombotic phenomena is always present without further invitation.

Distribution of radioactive phosphorus in the body is such that its use in the treatment of chronic lymphogenous leukemia, lymphoma, and Hodgkin's disease is not so reasonable as in the other conditions mentioned. This probably explains the lack of success encountered in its use for these diseases. In these three conditions, as well as lymphosarcoma, reticulo-endotheliosis, and a few others, metastases occur through the macrophage-lymphoid system (reticulo-endothelial system). One would like to treat such conditions by restriction of radiation to the tissues involved, avoiding encroachment upon nearby normal tissues. While complete attainment of this ideal may not be immediately possible, we believe that thoughtful selection of isotopes, proper forms of administration, and correct route of entrance into the body make a satisfactory compromise possible.

When particulate material of sufficient size is given by vein, it is promptly removed from the vascular system by the capillaries of the lungs, brain, and other tissues. Drinker and Shaw[1] found that when particles approaching colloidal size were employed, as much as 90 per cent were taken up by the phagocytic cells of the liver. More recently Jones, Wrobel, and Lyons[9] studied the biological distribution of resuspended particles of precipitated chromic phosphate containing the P^{32} isotope. In mice and dogs, they found that the liver removed 90 per cent of the intravenously injected material. Other tissues participating in the phagocytic reaction were the spleen, kidney, and lung.

When a very highly dispersed colloidal sol of ferric hydroxide was administered to dogs, Hahn and Whipple[4] found that a high concentration of iron resulted in the spleen and a somewhat lower concentration in the liver. Due to the bulk of tissue, the total amount in the liver was much greater. The lungs, kidneys, and bone marrow were shown to have taken up smaller amounts, probably in rough proportion to the phagocytic activity of the tissue. By determining iron chemically in the perfused tissues of these dogs, they were able to account for only one-half to three-fourths of the injected iron in all tissues studied. They believed that the remainder was probably to be found in the lymph nodes and related tissues, although quantitative analyses of these tissues were not carried out.

If, when given by vein, the distribution of highly dispersed sols is in rough proportion to the amount of lymphoid tissue (as is suggested by these data), one might reasonably expect to obtain a desired selective radiation effect on those tissues which are commonly affected in chronic lymphatic leukemia, Hodgkin's disease,

reticulo-endotheliosis, and in certain cases of lymphoma.

CRITERIA FOR THERAPEUTIC USE OF ISOTOPES

We may tentatively apply certain criteria to the type of material and its radiation spectrum when it is to be used in the manner thus suggested. If the particle size is all-important in determining the immediate distribution of the particles, this must be controlled by the method of preparation. Here the element must be of well-known chemical behavior. We must keep in mind the possibility that following initial sequestration of the particles, they might be liberated and presented to the systemic circulation and subjected to metabolic processes characteristic of their chemical nature. Knowledge of the biological behavior of the element is thus important. The "half-life" of the radioactive element must be considered in order that radiation be not prolonged beyond the desired time and yet be sufficiently long for its mission to be accomplished. In this connection, it has repeatedly been suggested that radiation is more effective against malignant tissue if administered in smaller doses over longer periods of time.[11] One must decide whether the path of ionization should be short, necessitating beta and weak gamma radiation or whether considerable penetration of tissue from the site of the deposited particle is desired, in which case, gamma radiators of suitable energy might be employed. Finally, the cost of producing the isotope in large enough amounts is highly important.

The chemical and biological behavior of manganese is well known.[17] Radioactive manganese can be made at a cost per millicurie considerably less than radio-phosphorus, providing that a cyclotron in the middle energy range is available (twelve to fourteen million electron volt deuterons). The "half-life" of the radioactive isotope of mass 52 (Mn^{52}) is only 6½ days. Thus, in the course of slightly less than a week, the patient receives half of the total radiation from the dose administered, and the intensity of the radiation in the same period will drop to half of the initial intensity. In the next 6½-day period, half of the remaining radiation is received (¼ of the total) and correspondingly, ⅛ in the next period, 1/16 in the following period, etc.

Radioactive manganese is prepared in the cyclotron by bombarding chromium with deuterons, the reaction being:

$$Cr^{52} + d^2 \rightarrow Mn^{52} + 2n^1$$

It should be noted that the parent Cr^{52} is present in ordinary chromium in the amount of 83.78 per cent. Another stable isotope of chromium, Cr^{54} is present in amounts of 2.30 per cent, and under deuteron bombardment, the additional reaction occurs:

$$Cr^{54} + d^2 \rightarrow Mn^{54} + 2n^1$$

Mn^{54} is a radioactive isotope of manganese with a "half-life" of 310 days. It has been estimated that it is present in activities of the order of 1 per cent of the total radioactive manganese produced in an ordinary bombardment. Radioactive manganese decays to stable chromium, the decay process requiring that the atomic nucleus increase its negative charge by one unit. Approximately 50 per cent of the time, this is achieved by the capture of an orbital electron, in which case, very soft x-rays are emitted (K-capture process). The other 50 per cent of the time, positrons are emitted by the nucleus with maximum energy of 0.582 million electron volts. Immediately after this process, three gamma rays are emitted in cascade, their energies being 1.46, 0.940, and 0.734 million electron volts respectively.[12] It is evident that, although not ideal, radioactive manganese meets most of the requirements which have been set forth. The presence of small amounts of 310-day manganese is important and must be considered in its therapeutic use.

It has been found that the element can be dispersed in a colloidal sol of ultramicroscopic particle size, using gelatin as a supporting colloid. Inspection of the sol in an ultramicroscope shows definite Brownian movement. Since it is made from a different parent element, it may be chemically separated from the original cyclotron target in very small amounts, permitting the use of total amounts of manganese

well below the toxic range of dosage. Intravenous infusion of the sol has not to date been followed by any clinical reaction such as nausea, or febrile reactions. This has been found to be true in the course of more than twenty-four instances of therapeutic administration.

PREPARATION AND ADMINISTRATION OF SOL

After purification* the manganese in the form of the chloride is autoclaved and 10 ml. of sterile 6 per cent gelatin solution are added.† Potassium permanganate is added dropwise in stoichiometric proportions to oxidize the Mn to MnO_2, and the solution made slightly alkaline with strong NaOH. Sterile technic is followed throughout. A good dispersion is characterized by having a clear, deep, tawny, port wine color to transmitted light and a greenish-grey cast under reflected light. The material may then be diluted with normal saline and administered with an ordinary infusion set. Extremely slow administration is not necessary.

In the present work, the amount of radioactive manganese in the dose was determined by measuring the gamma ray intensity at a known distance from the sample, using a Geiger-Muller counter. Approximately two inches of lead were used for filtration of the rays. The counter was calibrated with a standard sample of radioactive manganese.‡ After administration the radiation level of the patient was checked by conducting a topographical survey, as described in an accompanying paper, using a Lauritsen electroscope or some other suitable instrument. The rate of loss of the manganese from the body may be followed by successive determinations of stool aliquots, Greenberg, Copp, and Cuthbertson[3] having found excretion to be largely via the biliary tract. A metabolic ward is especially useful in such work.

DISCUSSION

A comparatively few patients have been treated as yet by this method of selective radiation of the lymphoid macrophage system. The disease processes under consideration are such that considerable time must elapse before an evaluation of this form of therapy can be made. The early results are promising, however, and will be reported at such a time as a fair clinical appraisal of the therapeutic results may be made.

It is quite possible that a number of isotopes other than manganese (6.5 day) might lend themselves to use in highly dispersed form and perhaps to better advantage. The choice of the isotope is largely dependent on the particular requirements of radiation spectrum, duration of radiation effect, and so on, as well as the judgment of the investigator. It is likely that the rapidly changing picture in the field of isotope economics will soon be an important factor in selection of the element to be used. Dosage is probably at present the major problem in therapy with isotopes. The empirical methods which have been developed in x-ray therapy are of little value in attempting to determine dosage levels with these materials, since the radiation spectrum varies over such wide limits with the employment of each different element and the degree of localization is distinctly modified.

It is difficult to establish criteria for the efficacy of therapy in the diseases under consideration. In Hodgkin's disease we have noted marked reduction in size of involved lymph nodes, as well as remission of fever. Some patients to date have been undertreated; and a conservative approach to the therapy has been followed, because of the paucity of information relative to the proper amount of selective radiation which might be tolerated by some of the normal tissue involved. As we increase the radiation dosage, it may be possible to establish better tests of the effectiveness of treatment. In the treatment of chronic or subacute lymphatic leukemia, we have been forced to depend for the most part on the differential white count to guide further increments in radiation. Where enlarged lymph nodes are present, their size, as well as the changes in size of the liver and spleen are useful guides.

*Target separations and purification were carried out by Professor J. W. Irvine, Jr., Massachusetts Institute of Technology.

†Supplied through the courtesy of Dr. D. Tourtellotte of the Charles B. Knox Gelatine Company, Camden, New Jersey.

‡Kindly provided through the courtesy of the Massachusetts Institute of Technology Radioactivity Center.

In all the malignant diseases of the lymphoid system, it is necessary to apply a rigorous amount of radiation, perhaps to the ultimate point of hazard to the patient if one expects to abolish the focal centers of the process in the many and far reaching mazes of this widely disseminated tissue.

SUMMARY

On appraisal of the results of use of the artificial radioactive isotopes in therapy, it is found that the greatest success has been obtained when there was some selectivity of uptake of the isotope. This may be attained by natural selectivity, as in the case of iodine in the thyroid or by judicious choice of the element, method of preparation of the material to be introduced into the body, and the route by which it is given.

A highly dispersed sol of radioactive colloidal manganese dioxide has been found to offer promise in the treatment of disease of the lymphoid-macrophage system. When administered by vein, this material is distributed throughout this system and radiation is thus directed to the tissue desired. Its use in the radiation therapy of Hodgkin's disease, chronic and subacute lymphatic leukemia, monocytic leukemia, lymphosarcoma, reticulo-endotheliosis, and such conditions involving the reticulo-endothelial system would seem to be indicated and early attempts have shown promise.

BIBLIOGRAPHY

1. Drinker, C. K.; and Shaw, L. A.: J. Exp. Med., **33**:77, 1921.
2. Fitz-Hugh, T., Jr.; and Hodes, P. J.: Am. J. Med. Sci., **204**:662, 1942.
3. Greenberg, D. M.; Copp, H. D.; and Cuthbertson, E. M.: J. Biol. Chem., **147**:749, 1943.
4. Hahn, P. F.; and Whipple, G. H.: Am. J. Med. Sci., **191**:24, 1936.
5. Hall, B. E.; Hargraves, M. M.; and Watkins, C. H.: Proc. Am. Fed. Clin. Res., **1**:25, 1944.
6. Hamilton, J. G.; and Lawrence, J. H.: J. Clin. Invest., **21**:624, 1942.
7. Hempelmann, L. H., Jr.; Reinhard, E. H.; Moore, C. V.; Bierbaum, O. S.; and Moore, S.: J. Lab. and Clin. Med., **29**:1020, 1944.
8. Hertz, S.; and Roberts, A.: J. Clin. Invest., **21**:624, 1942.
9. Jones, H. B.; Wrobel, C. J.; and Lyons, W. R.: J. Clin. Invest., **23**:783, 1944.
10. Kenney, J. M.: Cancer Research, **2**:130, 1942.
11. Low-Beer, B. V. A.; Lawrence, J. H.; and Stone, R. S.: Radiology, **39**:573, 1942.
12. Peacock, W. C.; and Deutsch, Martin: Physical Review, **69**:306, 1946.
13. Pecher, C.: Univ. Calif. Publ. Pharmacol., **2**:117, No. 11, 1942.
14. Ross, J. F.: Personal Communication.
15. Ross, J. F.: New Eng. J. Med., **226**:854, 1942.
16. Warren, S.: Am. J. Med. Sci., **209**:701, 1945.
17. Von Oettingen, W. F.: Physiol. Rev., **15**:175, 1935.

RETENTION AND EXCRETION OF MANGANESE DIOXIDE DISPERSIONS ADMINISTERED INTRAVENOUSLY TO HUMANS*

By C. W. SHEPPARD, PH.D.
and
P. F. HAHN, PH.D.
Nashville, Tennessee

INTRODUCTION

In evaluating the therapeutic effect of colloidal manganese dioxide containing radioactive manganese, it is important to know to what extent it is retained by the body after administration. If large amounts of material are quickly released after phagocytosis and promptly excreted, an undesirable limit may be set on the total radiation received by the patient. On the other hand, the rate of excretion is of importance in evaluating the ultimate, long-term effects of the small amounts (roughly one per cent) of 310-day manganese present. Excretion studies were therefore made on three patients who had received therapeutic doses of radioactive manganese. Measurements were also made of the gamma ray intensity at selected locations over the body surface of these patients and several others. In one case, the gamma ray measurements were repeated on several successive dates in order to follow the decline of the activity in the patient's body.

EXCRETION STUDIES

Immediately after administration of the colloidal material, twenty-four hour collections of stools and urine were instituted. Aliquot samples of urine were evaporated in small iron ointment tins and their activities were determined by placing them under a standard bell-type Geiger-Muller counter. Stool samples were diluted with water and worked up into a thin suspension. Primary aliquots were digested with sulfuric and perchloric acids, neutralized, and diluted to 250 c. c. Secondary aliquots were then evaporated to dryness in ointment tins and counted as before.

*Received for publication January 13, 1946.

*From the Department of Biochemistry, Vanderbilt University School of Medicine.

The excretion records for the three patients are shown in *Table 1.* In addition, a rough estimate of the fraction of the initial dose lost during each period is included.

GAMMA RAY MEASUREMENTS

Both the 6.5-day isotope of manganese and the 310-day isotope emit penetrating gamma rays. A considerable fraction of this radiation appears outside of the body. The intensity was measured at selected points using a Lauritsen electroscope with an aluminum walled ionization chamber. The radiation intensity and the points of measurement for a typical patient (*Case C*) are shown in *Fig. 1.* Several other patients presented essentially the same picture. It should be pointed out that variations in intensity are suppressed somewhat by the effect of scattered radiation, and radiation emitted from points at some distance from the location at which the electroscope was placed. However, the instrument has the advantage of extreme portability and simplicity which is almost essential when it is necessary to work in hospital wards.

DECREASE OF GAMMA RAY INTENSITY WITH TIME

A patient, (*Case A*), an eight-year-old boy weighing 48 pounds suffering from subacute lymphatic leukemia, received an initial dose of

RECORD OF EXCRETION OF RADIOACTIVE MANGANESE

Patient A			
Dosage	8 millicuries		9/27/45
Date	Amount excreted (millions of counts per min.)		Estimated fraction of initial dose exc.
	Urine	Stool	
9/27	0.6	—†	—
9/28	1.0	—†	—
9/29	0.1	50	0.070
9/30	1.0	12	0.020
10/2	1.0	1	0.004
10/3	0.1	1	0.002
10/4	0.6	2	0.006
10/5	0.5	0.7	0.003
(Collections temporarily discontinued)			
		Stool (Resumed)	
10/10		0.10	0.0004
10/12		0.05	nil
10/13		0.10	0.0005
10/16		0.07	0.0005
10/17		0.10	0.0007
10/18		0.10	0.0008

Patient B			
Dosage	11 millicuries		10/3/45
Date	Amount excreted (millions of counts per min.)		Estimated fraction of initial dose exc.
	Urine	Stool	
10/3	0.03	—†	—
10/4	0.01	40	0.030
10/5	0.01	0.7	0.001
10/6	0.02	3	0.004
10/7	0.01	2	0.003
10/8	0.02	—†	nil
10/9	0.01	1	0.002
10/10	0.02	0.4	0.001
10/11	0.01	—†	nil
10/12	0.01	0.6	0.002

Patient C			
Dosage	5 millicuries		9/24/45
9/25	0.05	23	0.040
9/26	0.01	1	0.001
9/27	0.01	—†	nil
9/28	0.05	0.7	0.001
9/29	0.01	0.1	nil
9/30	0.01	—†	nil
10/1	0.02	0.5	0.001
10/2	0.004	5.0*	0.020*
10/3	Lost		
10/4	0.03	2.0*	0.010*

*Contamination suspected.
†No stool excreted this day.

Table 1

8 millicuries. Successive sets of measurements were made with the electroscope and each set averaged. The decline of activity with time is shown in *Fig. 2*. The values are shown on a semilogarithmic plot together with the curve characteristic of the decay of the 6.5-day isotope of manganese.

DISCUSSION

The excretion record indicates that the principal fraction of manganese released is excreted by way of the bile, appearing in the stools. This is in accord with the work of other investigators in the field of manganese metabolism. The high amount of manganese present in the first stool after administration is of interest. It is estimated to be of the order of 5 per cent of the initial dose. It is suggested that this represents the fraction of the manganese whose particles approach molecular size, and may thus be too small to be effectively phagocytosed. The higher amount of urinary excretion in *Case A* is of interest, since this patient had severe biliary obstruction and jaundice during the course of the measurements. It is suggested that excretion occurred here accompanying the elimination of bile pigments in the urine. The jaundice was of particular interest, also, since the possibility was present that radiation damage of the liver had occurred. This appears to be remote in the light of our experience with several other patients who received much larger doses proportionately with no untoward hepatic effects.

In interpreting the gamma ray measurements, the limited resolving power of the instrument should be kept in mind. Thus, small localizations of activity will not be indicated except where the accumulation of the isotope is high. It is evident that this situation does not occur in the case of lymph nodes, the spleen, and other small body structures. However, the liver is sufficiently large and has a sufficiently high concentration of the isotope that a definite increase in radiation intensity is noted at points where the liver is close to the surface of the body. The higher concentration in the hepatic region is in accordance with data to be reported in a separate paper in which autopsy findings will appear.

The excretion of the isotope occurs predominantly in the bile. Nevertheless, after the first relatively large amount is liberated, the rate of excretion drops sharply and remains at a relatively low level thereafter. This fact is

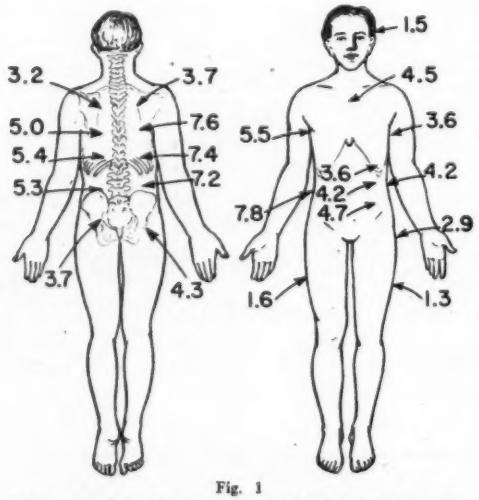


Fig. 1
Gamma ray intensities measured at selected body points with a Lauritsen Electroscope.

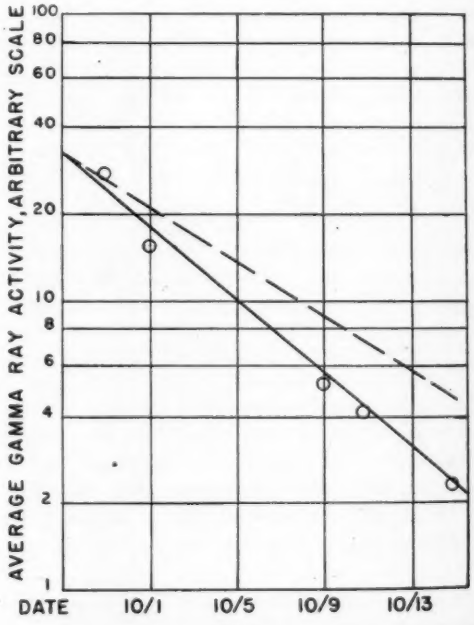


Fig. 2
Decrease of average gamma ray intensity with time for a selected patient.

also borne out by the gamma ray measurements which indicate that the mean bodily activity falls only slightly below the typical decay curve of 6.5-day manganese.

The interpretation of these measurements is complicated by the pathological conditions that prevailed in the subjects. However, the results indicate that the radioactive material is retained to a satisfactory degree during the active period of radiation. A slow, ultimate release of manganese is indicated. Further research is required before a satisfactory estimate can be made of the rate of release from a typical patient. At present, in the absence of this information, conservative practice is recommended concerning the amount of 310-day manganese, which may be allowed to accumulate in the patients under treatment.

SUMMARY

Excretion studies and gamma ray measurements have been made on selected patients who received therapeutic, intravenous doses of colloidal manganese dioxide. The results show that an appreciable fraction (about 5 per cent) of the initial dose is excreted through the bile immediately after administration. The body then retains the remainder, losing it at a slow rate. The gamma ray intensity at the body surface is greatest near the region of the liver.

THE USE OF RADIUM AND ROENTGEN RAYS IN THE TREATMENT OF HYPERPLASTIC LYMPHOID TISSUE IN THE NASOPHARYNX AND PHARYNX*

By GILBERT E. FISHER, M.D.†
Birmingham, Alabama

In previous communications,[1,2] the author has endeavored to stress the importance of the use of radium in the treatment of hyperplastic lymphoid tissue located in the nasopharynx.

Infection and hyperplasia in the nasopharyngeal lymphoid tissue is of such great importance as an etiological factor in systemic disease, that it should warrant careful attention and consideration. This tissue plays an important role in otolaryngology as the primary focus for pyogenic infections occurring in the upper air passages. Primary infections in this tissue extend to the sinuses, ears, larynx, trachea and bronchi, producing, in uncontrolled cases, otitis media, mastoiditis, deafness, chronic bronchitis, and bronchial asthma.

Dr. S. J. Crowe[3] and his associates, working in the Johns Hopkins Hospital, have found radium so valuable in reducing the size of hyperplastic nasopharyngeal lymphoid tissue, that this method of therapy is now used routinely as an adjunct in the treatment of mouth breathing, recurrent nasopharyngitis, impairment of hearing due to tubo-tympanic catarrh, suppuration of the ears, infection of the accessory nasal sinuses and asthmatic bronchitis. They found, in studying 1,365 school children between the ages of 8 and 13 years, that more than 75 per cent had marked recurrence of the lymphoid tissue in the nasopharynx following tonsillectomy and adenoidectomy. I would like to stress that this was not due to an incomplete operation, but to the fact that the lymphoid tissue is an integral part of the mucous membrane, and thus cannot be removed entirely by surgical means.

Repeated infections of the upper respiratory tract result in hyperplasia of the lymphoid tissue. This produces excessive secretion of mucus, obstruction to breathing and the eustachian tubes, and the persistent lowering of resistance of the patient to infections. In older children this results in the so-called "granular pharyngitis," and continued infection in this tissue produces the commonly recurring nasopharyngitis and pharyngitis seen in adults. Long standing partial or complete obstruction of the eustachian tubes is the commonest cause of conduction deafness. Therefore, it behooves us to keep in mind the facts proven by the above mentioned investigators and treat this nasopharyngeal lymphoid tissue by irradiation as often as is necessary to cause its atrophy and obliteration.

Crowe[3] says:

"Infected and hypertrophied adenoid tissue should

---

*Read in Section on Ophthalmology and Otolaryngology, Southern Medical Association, Thirty-Ninth Annual Meeting, Cincinnati, Ohio, November 12-15, 1945.

†Chief of Department of Otolaryngology and Bronchoscopy, The Medical College of Alabama.

always be removed surgically. The combination of operation and irradiation, or irradiation alone, prevents recurrences or reduces the size and susceptibility to infection of the recurrent nodules of lymphoid tissue in the nasopharynx and pharynx. If radiation is employed, the otolaryngologist must realize that it does not destroy or permanently remove the adenoid tissue. It merely slows up, or for a time stops the reproduction of lymphocytes and in this way causes a gradual decrease in size. Usually two or three treatments are necessary to obtain the desired results, and they may have to be repeated once or twice each year until a child reaches the age of puberty. After this period there is a spontaneous regression of lymphoid tissue in the upper air passages in most children."

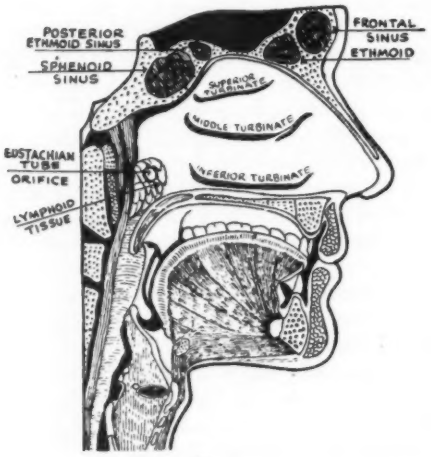


Fig. 1

Saggital section of head showing in a rough manner the approximate location of the nasopharyngeal lymphoid tissue, and its relation to the eustachian tube orifice.

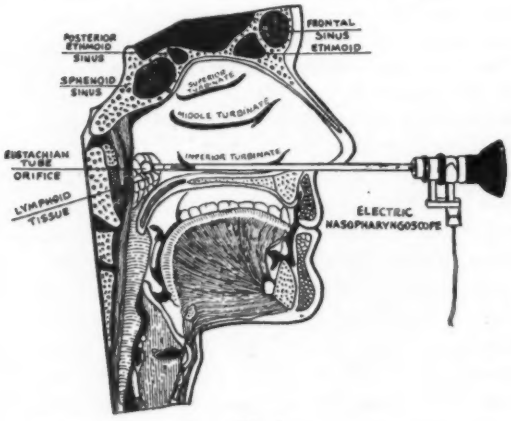


Fig. 2

Demonstrates the electric nasopharyngoscope in place in the inferior meatus. This electric telescope gives a clear, accurate picture of the nasopharynx and its contents.

However, it has been the author's observation that lymphoid tissue in the nasopharynx and pharynx, untreated by irradiation during childhood, persists in the adult. Several hundred adults have been observed who have undergone tonsillectomy under a local anesthetic, to have a huge mass of persistent nasopharyngeal lymphoid tissue completely obstructing the eustachian tube orifices and filling the nasopharynx. This fact should not keep one from performing tonsillectomy under a local anesthetic where indicated, but should remind one that there is nasopharyngeal lymphoid tissue still intact which should receive radiation therapy, because it is a persistent site of infection.

During the past five years, the writer has examined with the electric nasopharyngoscope, and treated with radium, over 1,000 patients whose nasopharynx and pharynx harbored hyperplastic and infected lymphoid tissue. Over one-half of these patients were originally treated with a 50 mgm. radium applicator. The applicator had a platinum capsule 0.5 mm. in thickness. The capsule was attached to a copper wire 17.5 cm. in length. The capsule and wire were covered with a coating of gum rubber 0.7 mm. in thickness. Recently a new applicator,

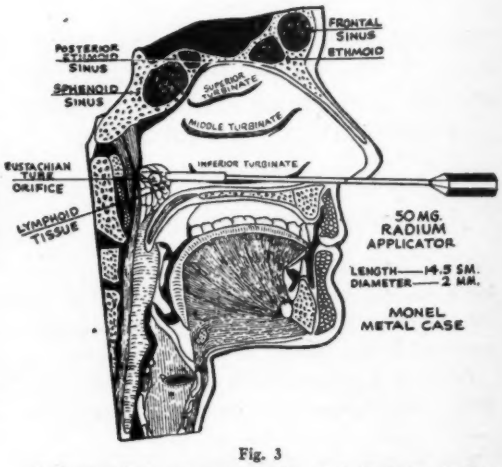


Fig. 3

Radium applicator shown in position. This illustration is not completely accurate, as in actual application, the central point of the radium capsule lies adjacent to the eustachian tube orifice.

designed by Burnam and Crowe[4] of Johns Hopkins, has been obtained which has aided considerably in results produced as well as in diminishing the time of application.

"The active part of the applicator is a monel metal or a stainless steel tubular chamber 15 mm. in length, with an inside diameter of 1.7 mm., a wall thickness of 0.3 mm. and an outside diameter of 2.3 mm. The chamber contains 50 mg. of radium sulfate. The absorption capacity of a filter is proportional to its density. To absorb all beta rays only 0.5 mm. of platinum, gold or tungsten is required, one mm. of lead or silver, two mm. of brass or monel metal, and ten mm. of aluminum. Even when all primary beta radiation is absorbed there is secondary beta and gamma radiation from the filter which is most penetrating from metals of high density. This secondary radiation is not large from monel metal or stainless steel and for the treatment of the nasopharynx with this applicator a secondary screen of lighter material is not necessary."

The dosage that has been found most effective with this applicator is 8.5 minutes in each side of the nasopharynx. Usually treatments are given at 25-day intervals and as a rule three treatments are adequate but in refractory cases four or five may be necessary.

The author uses the following method of application: A 1 per cent solution of cocaine is lightly sprayed into each inferior meatus. A cotton tipped applicator, moistened with three drops of 5 per cent cocaine, is then gently passed along the floor of each inferior meatus. After an interval of five minutes, the radium applicator is inserted through the inferior meatus into the nasopharynx. An electric nasopharyngoscope is then passed along the opposite inferior meatus to see, under direct vision, that the radium capsule is in its proper place at the orifice of the eustachian tube. The applicator is then left in place for 8.5 minutes, after which time it is removed and a similar treatment is given the opposite side of the nasopharynx.

Beginning in January, 1945, we have used x-ray therapy, following the application of the routine radiation of the nasopharynx, directed toward the many islands of lymphoid tissue found in the lateral and posterior pharyngeal walls. The x-ray treatment is as follows:

150 kilovolts, 0.5 mm. copper and 1. mm. aluminum filter. 150 r. to each side of neck each week for three successive weeks. Wait four weeks and repeat, if necessary.

This procedure has proven so successful that it is now used in a large percentage of the cases seen in which radium therapy is indicated.

During the first week following the treatment, there may be a slight subjective sensation of "stuffiness" or "fullness" in the nasopharynx, accompanied by a moderate increase in the amount of postnasal discharge. This is followed by a diminution in the amount of postnasal discharge, so that 30 days following treatment very little, if any, discharge is noticed. Examination of the nasopharynx, with the electric nasopharyngoscope, six weeks after treatment usually reveals definite diminution in the size of the lymphoid tissue, as well as a marked decrease in the amount of tenacious mucoid discharge.

The results obtained in treating deafness, particularly in children, associated with malfunction of the eustachian tubes; recurrent acute upper respiratory infections, especially those beginning with irritation in the nasopharyngeal lymphoid tissue; recurring attacks of otitis media; bronchial asthma, particularly in children; aero-otitis; tinnitus and vertigo, in selected cases; and chronic obstruction of the posterior nares in children by this method, have been uniformly good and exceedingly encouraging. There have been failures in approximately 11 per cent of the cases thus treated, but I am certain that where failure of the desired end result has occurred, it was because I failed to give a sufficient number of treatments. This method of eradicating hyperplastic nasopharyngeal lymphoid tissue is easily and painlessly administered, causes no ill effects or loss of time from the patient's work, and is highly recommended as an adjunct in the elimination of a certain focus of infection.

BIBLIOGRAPHY

1. Fisher, Gilbert E.: Recognition and Radium Treatment of Infected and Hypertrophied Lymphoid Tissue in the Nasopharynx (Preliminary Report). Archi. Otolaryngol., **37**:434-436 (March) 1943.
2. Fisher, Gilbert E.: Recognition and Radium Treatment of Nasopharyngeal Lymphoid Tissue. Sou. Med. J., **36**:702-703, (Oct.) 1943.
3. Crowe, S. J.: The Nasopharynx. Archi. Otolaryngol., **33**: 618-622, (April) 1941.
4. Burnham, Curtis F., and Crowe, S. J.: The Monel Metal Radium Applicator Designed for Maximum Use of Hard Beta Rays in the Treatment of Nasopharyngeal Hyperplastic Lymphoid Tissue. Mississippi Valley Med. J. & Radiologic Review, **67**:109-111 (Oct.) 1945.

DISCUSSION (*Abstract*)

Dr. R. W. Bledsoe, Covington, Ky.—Forty-five and fifty years ago, we swabbed crystals of cocaine on the tonsils and removed part of it with the guillotine; some more crystals were mopped, supposedly, upon the adenoid, but in all probability it was washed off the applicator by blood gushing from either tonsil. The pain and hemorrhage were terrific.

Because the seeds or islets of the lymphoid tissue are an integral part of the mucous membrane, as Dr. Fisher has reminded us, there is no surgical instrument made, nor will any be made, which will positively remove all adenoid tissue.

Knowing this fact, it has been my custom for the past forty-five years to remove as much adenoid tissue as possible with forceps and curette. But what I have always considered the most important part of the operation is the wrapping of gauze around my index finger, going up behind the soft palate to the vault of nasopharynx, and sandpapering, as it were, the entire nasopharynx, never neglecting to work thoroughly above, in front of, and particularly behind the eustachian tube. Then repeat with the second and third piece of gauze. This gives a much cleaner, more quickly healing nasopharynx. Fewer x-ray or radium treatments will then be required to destroy what little lymphoid tissue remains.

Quoting Dr. S. J. Crowe to whom Dr. Fisher referred, "If radiation is employed, the otolaryngologist must realize that it does not destroy or permanently remove the adenoid tissue. It merely slows up or, for the time, stops the production of lymphocytes, and in this way causes a gradual decrease in the size."

I fear Dr. Crowe is a little too conservative in this statement. I think it has been definitely decided that properly filtered gamma rays do destroy and permanently remove lymphoid tissue.

As I understand it, the more embryonic the tissue, the more sensitive it is to radium or x-ray; the higher in the scale of tissues, the less sensitive. Nerve tissue and other normal tissues are only slightly sensitive; as example, the very slight sensitiveness of brain tissue to the effect of the pure gamma rays. This is known as Bergonie's law, converse to the law of dissolution.

I understand that in the hands of a properly qualified man, radium and x-ray can now be used with perfect safety. I also understand that at the Mayo Clinic and many other large clinics, x-ray is now used routinely in the treatment of acute as well as chronic sinusitus.

Again quoting Dr. Crowe, "It has been my observation that lymphoid tissue in the nasopharynx and pharynx, untreated by radiation during childhood, persists in the adult."

I have found moderate-sized tonsils and adenoids, apparently inoffensive at least as far as the patient knew in quite a number of persons eighty years old or more, and on the contrary, I have seen quite a number of persons as young as forty-five, with absolutely no vestige of tonsil or adenoid, who had never been operated upon nor had ever complained of sore throat.

My theory conceived many years ago is that once the adenoid or tonsil becomes infected, they are infected for the life of the patient or until they are radically removed. If a person can pass through childhood and adolescence to around the age of thirty-five without ever having had an infection of the tonsil or adenoid, around this age nature will cause the gradual absorption with eventual total elimination of all lymphoid tissue in the area.

Radium or x-ray will do it in three months or less.

Dr. Fisher did not refer to the size of exposure with the x-ray. With Dr. Fisher's permission I would like to say that the area to be exposed is 2½ by 2½ inches applied to each side. The diaphragm should be cut down to that area.

Dr. W. W. Wilkerson, Nashville, Tenn.—I have been using this radium applicator for approximately a year. I have nothing to add to Dr. Fisher's paper except to say that my results, too, have been excellent. There are two questions I would like to ask the doctor:

First, just why he uses it in bronchial asthma; and secondly, what precaution he takes personally in using the applicator.

Dr. H. B. Searcy, Tuscaloosa, Ala.—I would like to call attention to the fact that things in medicine go in cycles. About twenty years ago we used deep x-ray therapy for shrinking the lymphoid tissue of the neck: the tonsils and adenoids. Our results were very disappointing until two or three years later when we found we had some wonderful results.

Irradiation is a slow process. It can be overdone and one does not know it until later when he has gotten a dry throat. In giving this deep x-ray therapy, one should under-treat rather than over-treat, for it can always be repeated.

In these days of highly chlorinated drinking water, the chlorine is replacing the iodine in the system. According to the halogen replacement law, many of these cases of hypertrophied recurrent adenoid masses in the throat, are due to nothing but a lack of iodine in the system.

In treating all these cases, therefore, do not forget you are physicians. Advise a diet. In particular, stop the excess of sugar and give iodine.

Dr. C. E. Gillespie, Seymour, Ind.—I would like to ask Dr. Fisher if this applicator contains the radium, or whether we can use our own radium.

Dr. S. M. Herron, Jackson, Tenn.—It has been my experience for many years that practically all of the cases that have returned to me with recurrence of lymphoid tissue have been obese. This is a recurrence I am investigating now. In other words, overall fat. I wonder if there is any connection between the thyroid gland and this lymphoid tissue, or any endocrine function, that would throw any light upon it.

I was very gratified to hear the doctor speak of using his finger. I was taught to use my finger in removing lymphoid tissue, and I have always stuck to it even at

the danger of losing a bit of reputation with some anesthetists who seem to shudder when I pass my finger in the nasopharynx. You know what you are doing when you use your finger, and you know what you are removing. I have seen some very hazardous things happen with the adenotome.

Dr. O. M. Marchman, Dallas, Texas—Lymphoid tissue in the nasopharynx is a very much neglected field, and I am happy to note the excellent results that Dr. Crowe has been having for the last few years with irradiation.

We all know that the tonsil has a very definite capsule, and when removed the nerve returns, while the lymphoid tissue of the adenoid in the nasopharynx has a very limited capsule or none at all, and consequently we do not remove it in the capsule as we do the tonsil, and as a result it is prone to return, as we are all aware, especially in children.

We always regard the adenoid space, the nasopharynx, as the hot spot. That is where most of our colds begin, as we know.

I think this is neglected because of the fact that we use the adenotome without direct vision. These operations should be done under direct vision, not only to remove as much tissue subsequently with the adenotome but to follow it up with a long shank curette, so that we can go to the posterior nares and remove as much tissue as possible.

I not only use that but I use the punch to go over any follicles, not only in the nasopharynx but in the oropharynx, and see that it is completely removed. I think we make our error there in many cases, especially in adults, in that we pay very little attention to the lymphoid tissue in the nasopharynx, as we see many cases where the tonsils have been removed, where lymphoid tissue in the nasopharynx has been left.

Regardless of how small it is, it becomes affected as Dr. Fisher says, in repeated colds, and enlarges. It is the spot where we have most of our infections.

The only thing that I see objectionable in this treatment is that it has to be repeated often. The lymphoid tissue returns, and treatment is repeated several times every few years. We cannot get our patients to undergo these treatments though the procedure is simple.

Dr. Fisher used radium eight and a half minutes. Dr. Crowe uses it just three minutes in many cases. I would like to ask about the local anesthetic. Two per cent "pontocaine" is what I use. I would like to know if there is any advantage in the cocaine over "pontocaine." I get a better anesthetic in "pontocaine."

Dr. Edgar P. Cardwell, Newark, N. J.—I would like to ask if there are not other radioactive sales which are being used in these applicators.

I would also like to have Dr. Fisher comment, if he will, on the cost of the treatment.

Dr. Fisher (closing).—Dr. Wilkerson asked why we use this treatment in bronchial asthma. I mentioned bronchial asthma as just one of the many complications resulting from infection in the nasopharynx, because I feel relatively sure that chronic postnasal discharge from an infected mass of lymphoid tissue in the nasopharynx reaches the trachea and bronchi. This discharge frequently finds its way into the trachea at night while the patient is asleep, causing secondary infection. The discharge contains streptococci, staphylococci and pneumococci.

Whenever you have an acute cold it is a common occurrence to clear your throat in the morning and have a copious amount of discharge from the trachea. Dr. Crowe has felt for years that in bronchial asthma, one of the chief etiological factors was the amount of postnasal discharge exhibited. This is especially true in sinusitis where there is a profuse chronic postnasal discharge dropping into the trachea, irritating the tracheal, laryngeal and bronchial mucosa. Thus, if the nasopharyngeal lymphoid tissue can be eliminated as a focus of infection by irradiation, this treatment is indicated.

A question was asked about the precaution the doctor uses. If this applicator is used very often, you will find that it can be quickly taken out of a small lead case in which it is stored and inserted into the patient's nasopharynx. This affords very slight exposure to the physician. Because of the limited amount of exposure that he gets from this monometal capsule, I do not think the physician is undergoing any undue danger in using it. I take it out of the lead capsule and insert it into the nasopharynx. Then I step out of the room in which the patient is being treated. The time clock is set at 8.5 minutes and when the bell rings the applicator is moved from one side and place in the other side. When the applicator is removed I wipe it off with alcohol using an ordinary straight bayonet forcep and a little cotton. I believe there will be no difficulty in any respect with regard to exposure.

Dr. Gillespie asked whether he might use his own radium in a different container from the one we use. Yes, but in using your own radium and having it put into a little capsule attached to a copper wire such as that which most roentgenologists use for inserting radium into the cervix, you will find it necessary to study your filtration factor so that you can determine the length of time that you have to leave it in the nasopharynx to administer the two-gram-minute treatment.

Dr. Marchman asked about the length of our treatment as compared with the three-minute treatment used by Dr. Crowe. Dr. Crowe uses a little different applicator. He uses a metal capsule very similar to this applicator we use, which contains radon, rather than radium salts. His applicator is impractical for a person in a small city to use, because you have to have a large radiological institute nearby to furnish a glass capsule filled with the radon element at least once each week, as the radon rapidly loses its potency. At Baltimore every Monday morning an applicator is sent over to Dr. Crowe from the Howard Kelly Radiological Institute in which there is usually 500 millicuries of radon. Five hundred millicuries of radon is equivalent in its

potency to 500 milligrams of radium sulfate. Thus you see there is a considerable change in the time factor when using 500 millicuries compared with 50 milligrams of radium sulfate.

The monometal applicator which I have described is so devised that it must be left in place about eight and a half minutes to get a two-gram minute treatment administered to the nasopharynx.

Dr. Cardwell asked about the other radium salts and the cost of the treatment. I think different radium salts can be used. It just has not been my experience to use any other than the one we used in Baltimore. The applicator I now own, which I purchased from the Radium Chemical Corporation, New York City, contains 50 milligrams of radium sulfate.

Dr. Herron asked a question with regard to persons who are obese. There is a definite connection between the thyroid gland and the lymphoid tissue most certainly. We find that children who are obese have a much larger mass of lymphoid tissue than those who are thin and emaciated.

I might also say in passing that most of you people from the Southern states see many Negro patients. In the Negro there is a much larger mass of lymphoid tissue and tonsillar tissue, and you all know you see peritonsillar infection or abscess much more frequently in colored people than in white people. Just why that is, Dr. Herron, I do not know, but these observations are made so frequently that one is compelled to establish it as a fact.

There is one other thing I would like to mention in respect to Dr. Marchman's questions about the return of the lymphoid tissue. Regardless of whether you personally have, or have not, performed the tonsillectomy and adenoidectomy on a child who returns in one year following operation with a large amount of recurrent lymphoid tissue in the nasopharynx, you should record the findings accurately and treat the patient accordingly. It is no disgrace whatsoever to have a young patient return one year following operation with a large recurrent mass of nasopharyngeal lymphoid tissue, for I have seen it occur in many children whose nasopharynx I personally curetted as thoroughly as possible, and could feel no remnant of lymphoid tissue at the conclusion of the original operation.

If you remove the tonsils and adenoids in young children, I think you ought to tell the parents that the child will certainly have a recurrence of lymphoid tissue. In over thirteen hundred children examined in Baltimore by Dr. Crowe and his associates, they found over 75 per cent had a large recurrent mass of lymphoid tissue. Those patients had not been operated upon only by individuals at Johns Hopkins, but generally throughout Baltimore. I feel sure most of them had a good primary operation. Many of these patients I personally operated upon, and thought at the time of operation that we had thoroughly removed all the tonsillar tissue and all the lymphoid tissue of the nasopharynx. To my great surprise, the first time they had a cold, perhaps in as short a time as ten months after the operation, I found a large mass of lymphoid tissue again.

I am entirely impartial about the thing, because I have seen it happen in so many of my own cases in which I surely felt that every bit of the lymphoid tissue had been removed.

I am glad, Dr. Marchman, that you mentioned the curette. Many people mentioned the adenotome. Unquestionably the adenotome has its place in the hands of those skilled in its use, but if one is to remove the all important masses of lymphoid tissue on the lateral nasopharyngeal walls adjacent to the eustachian tube orifices, one must use the curette. You will be surprised how much lymphoid tissue you will take out, even after you have used the adenotome and removed a large mass of lymphoid tissue from the central part of the nasopharynx.

ROENTGENOLOGICAL CONSIDERATION OF GASTRO-INTESTINAL DISTURBANCES WITH SPECIAL REFERENCE TO THE STOMACH AND DUODENUM*

By Roy G. Giles, M.D.
San Antonio, Texas

The roentgen ray diagnosis of gastro-intestinal disturbances has been selected not because of anything new or any unusual development in the procedure but to call attention again to some points in reference to the x-ray examination, which physicians may fail to keep in mind, unless engaged in this special field of work. The diagnostic difficulties often encountered in determining the origin of certain pathological signs are well known to every physician. The physician should seldom make a diagnosis by hard and fast rules but should carefully consider the exceptions, the variations and the common sources of error, when considering any group of symptoms.

This fact is well illustrated when considering the complex syndrome of symptoms described in connection with alimentary disturbances. The British[5] refer to the many gastric ills as "dyspepsia" a term which they employ apologetically as designating a complex group of symptoms. Miller[10] (Professor of Clinical Medicine, University of Pennsylvania) refers to the complexity

*Read in Section on Radiology, Southern Medical Association, Thirty-Ninth Annual Meeting, Cincinnati, Ohio, November 12-15, 1945.

of symptoms accompanying gastric disorders as "indigestion." The complex group of symptoms which accompanies gastric disturbances has taxed the patience and judgment of the medical profession for centuries. The alimentary symptoms of the dyspeptic run the scale of anorexia, nausea, vomiting, eructations, dyspepsia, gas, bloating, indigestion, abdominal discomfort, gnawing pain, heartburn, heart pulsations, tremors, flushes, arterial pulsations, complaints of spells of faintness, short and labored breathing and so on.

The trained and careful searching roentgenologist accords to each patient his full and undivided interest and attention. Most physicians do not seem to know or believe that accuracy and skill in the use of the fluoroscope, in any field of medicine, can be acquired only by constant and continuous observation. The x-ray examination is a highly special personalized form of medical attention, demanding of its examiner his very best performance as a physician, as a roentgenologist, as a counselor to the patient and referring physician.

It is true that expert roentgenography supersedes all other methods of examination of the stomach and duodenum, and therefore, any patient who complains of digestive disturbances, no matter how vague or how unconvincing these symptoms may appear to be, is entitled to a painstaking, careful, searching, x-ray examination of his gastro-intestinal tract. The etiology of epigastric distress is so varied that the task is difficult, if not impossible, to mention the causes referring to all the organs that may give rise to alimentary symptoms classified as chronic dyspepsia or indigestion in a brief paper. The gastro-intestinal lesions that produce indigestion are many and may be grouped as follows:

(1) Diseases due to stomach and duodenum.

(2) Disorders resulting from abdominal viscera, other than the stomach itself.

(3) Disorders in organs remote from the abdominal viscera, or some systemic disease.

(4) Disorders resulting from neuroses or functional disturbances.

(1) *Diseases of the stomach and duodenum.* —Perhaps gastric malignancy, gastric and duodenal ulcer and gastritis account for 98 per cent[8] of the organic diseases in the stomach and duodenum. The accuracy of the roentgen ray examination in the diagnosis of cancer of the stomach, ulcer of the stomach and duodenum, is probably 95 per cent[9] and should be employed in all cases of indigestion and dyspepsia. The trained and carefully searching roentgenologist can expect to demonstrate cancer of the stomach, ulcer of the stomach and duodenum in not more than 15 per cent of all patients who complain of the complex syndrome of symptoms accompanying indigestion or dyspepsia. A negative x-ray report would also exclude positive x-ray forms of gastritis and the majority of rare forms of gastric and duodenal lesions, such as benign and malignant granulomatous and lymphomatous tumors, diverticula, the majority of diaphragmatic hernias and the occasional deformity produced by extensive adhesions.

A careful, painstaking roentgenological examination will rule out the majority of the organic diseases of the stomach and duodenum. Thus a negative x-ray examination of the stomach and duodenum, in the process of elimination of gastric disorders is of maximal importance to the examining physician when made by a trained and experienced roentgenologist. The cautious physician, therefore, does not assume the attitude that there is nothing wrong with the patient, but he realizes that probably he is confronted with an important diagnostic problem.

Gastric carcinoma[2] accounts for approximately 27,000 deaths annually constituting about 18 per cent of the cancer deaths in the United States each year. Cancer of the stomach in its early stages presents no symptoms. Nausea, vomiting, weight loss and upper abdominal discomfort are symptoms of late malignancy. The examining physician should rule out the possibility of gastric malignancy by a careful roentgenological examination, in any individual of cancer age suffering with indigestion. The x-ray examination is of more value in the diagnosis of gastric cancer than any other diagnostic method, sign or symptom. In carcinoma of the stomach the x-ray examination usually shows a filling defect, often rigid and constant, accompanied by a ragged alteration in the contour of a portion of the stomach. However, probably 5 per

cent of early carcinomas are not demonstrated by expert x-ray examination.

Ulcers of the stomach and duodenum often referred to as peptic ulcer, seem to be more and more a disease of civilization. The emotional factors appear to play an important role in the patient suffering from peptic ulcer as well as in those with physical disease in other organs. Peptic ulcer is rather rare in those countries of the world where stresses, strains and tension are absent.

Many reports indicate that peptic ulcer is on the increase in both the civilian and military populations. This increase was noted by Hinton[7] in 1933; Wolfert[13] in 1937, and Rivers and Ferreira[11] in 1938, in the United States. In this connection Sir Henry Tidy[12] says:

"The prevalence of dyspepsia organic and non-organic in the army in the war is a reflex of its incidence in the civilian population, which has greatly increased in the last 20 years. There is no evidence of undue development of fresh cases of peptic ulcer in the army."

Boles[1] reports in a personal communication from Pendergrass that in 1940, 1,000 cases of stomach and duodenum were studied in the University of Pennsylvania Hospital. In this series 19 cases of gastric ulcer were found (1.9 per cent) and 92 cases of duodenal ulcer (9.2 per cent) making a total of 11.1 per cent of cases studied. This report does not indicate an increase in the occurrence of gastric or duodenal ulcer. During the first six months of 1945, 307 cases had x-ray study, of stomach and duodenum in the Medical and Surgical Hospital, and 38 or 12.4 per cent showed organic disease. The x-ray examination of the stomach and duodenum is unquestionably the best means of determining the presence of peptic ulcer. The accuracy of the roentgen ray examination in the diagnosis of peptic ulcer is at least 95 per cent today and should be employed in all cases of chronic indigestion or dyspepsia. A negative roentgenological diagnosis except after recent hemorrhage is seldom in error. Contrary to popular opinion, gastric analysis has been found to be of little help, although the acid figure in duodenal ulcer is usually high.[2] Horner[8] is of the opinion that analysis of the gastric contents is of secondary importance; however, it should not be overlooked. There are many exceptions, to wit: some patients with gastric cancer have normal or even high values and the ulcer patient cannot always be considered as having hyperacidity.

The x-ray signs of duodenal ulcer are:

(1) Demonstration of crater in bulb.

(2) Deformity of bulb.

- (a) Collar button.
- (b) Clover leaf.
- (c) Narrow peak.
- (d) Defect on lesser or greater curvature.

(3) Narrowed second portion of duodenum.

Gastric ulcer most commonly occurs along the lesser curvature at or near the junction of the lower and middle thirds. The niche in this location is characteristic. As a rule gastric ulcers are readily apparent in other instances quite obscure.

The occurrence and incidence of carcinomatous degeneration of gastric ulcer has been a very controversial subject. It seems to be more important whether a given lesion is malignant or benign. As in the case of the niche along the lesser curvature, a careful evaluation of all the details involved should make possible a differential diagnosis in the great majority of cases between the benign or malignant nature of a prepyloric lesion to act as a guide in any therapeutic approach. It is true that the patients for whom a differential diagnosis is difficult are not many compared with the large number for whom a correct diagnosis is made.

(2) *Disorders in Abdominal Viscera, Other Than the Stomach.*—Eusterman[4] found that gastric disturbances arising reflexly from abdominal viscera, other than the stomach itself are responsible for 30 to 40 per cent of all digestive symptoms. Diseases of the gallbladder, appendix, pancreas, liver, small bowel, or colon may give rise to gastric disorders. Not only are emotional factors important in considering diseases of the gallbladder, with or without the presence of stones, but cholecystitis is probably the cause of chronic recurring types of dyspepsia more frequently than any other disease. Cholecystographic studies are essential and study of the gallbladder should be done in conjunction with the x-ray studies of the stomach and duo-

denum in all cases suffering with chronic dyspepsia.

Dwyer and Blackford[3] reported the chronically diseased appendix the cause of gastric symptoms in 5.5 per cent of 3,000 cases studied. Diseases of the pancreas and liver are occasionally responsible for indigestion. The malignant pancreas especially without jaundice presents symptoms referable to the alimentary tract. Spastic colitis, "irritable colon," carcinoma and intestinal parasites accounts for a good deal of the so-called "stomach trouble."

(3) *Disorders in Organs Remote from the Abdominal Viscera or Systemic Disease.*—Eusterman[4] reported that the various diseases and intoxications accounted for 15 to 20 per cent of the cases of chronic dyspepsia. Diseased processes in organs outside the abdomen such as the nervous, urinary, pulmonary, and circulatory systems can give rise to dyspepsia, hyperacidity, belching, distension of the abdomen, flatulence, and nausea, simulating abdominal disease. On the contrary diseases of these systems may occasionally be hidden by gastro-intestinal symptoms. Heart disease, pulmonary tuberculosis, or renal stones occasionally give rise to gastric disturbances closely simulating duodenal ulcer. Systemic disease of importance which may be the site of indigestion are diseases of the endocrine glands, deficiency diseases, (pernicious anemia, pellagra, sprue and carcinoma[6] particularly of the breast), toxic states and the unrestrained use of alcohol and tobacco.

(4) *Disorders Resulting from Neuroses or Functional Disturbances.*—Eusterman[4] estimated that gastric disturbances resulting from neuroses make up about 25 per cent of the whole group of alimentary symptoms. The fact that the emotions may play an important part in the development of "sickness" in various parts of the gastro-intestinal tract is recognized by many patients as well as physicians. As an example the student may develop diarrhea, anorexia and nausea before final examination. The business man may complain of heartburn, indigestion and abdominal pain, at the time of important conferences or business reverses. The nervous housewife may develop constipation and indigestion when there is house cleaning to be done or the children cause unusual worry.

The roentgenologist not infrequently has referred for x-ray examination of the gastro-intestinal tract, a patient who may be of any age but is more often between the age of 17 and 40, complaining of nervous indigestion, migraine, nausea, sometimes vomiting, in whom the roentgenologist is unable to demonstrate an organic or physical disease of the stomach or duodenum, that would explain symptoms of the dyspepsia. Many regard the symptoms of nervous indigestion as a functional disorder of the stomach, usually occurring in highly emotional and hysterical individuals subject to such exciting causes as great anxiety, violent passion, dissipation, social excesses, mental overtaxation, grievances or startling news.

The examining physician must take a careful history, employ a thorough physical examination and by all means refer the dyspeptic patient for a competent and skilled x-ray examination and suitable laboratory work to establish a diagnosis of organic or non-organic dyspepsia. Usually thorough physical, x-ray and laboratory examinations separate the patient complaining of "nervous indigestion" from any fear of organic disease, particularly cancer, and further examination seems to lose its significance.

SUMMARY

The importance of a complete investigation of every patient with indigestion or dyspepsia is stressed, employing, in addition to a careful history, a thorough physical examination and a careful x-ray study, all the available diagnostic procedures.

It is true that expert roentgenography is of more value in diagnosing organic disease of the stomach and duodenum than any other diagnostic method, sign or symptom.

The trained and careful searching roentgenologist can expect to demonstrate organic diseases in the stomach and duodenum in not more

than 15 to 20 per cent of the patients who complain of gastro-intestinal symptoms.

REFERENCES

1. Boles, R. S.: Observation in the Prevention and Management of Peptic Ulcer. J.A.M.A., **126**:641 (June 27) 1943.
2. Cecil, R. L.: Textbook of Medicine. Sixth Ed., p. 679. Philadelphia: W. B. Saunders Co.
3. Dwyer, M. F.; Blackford, J. M.; and Cole, W. S.: A Review of 1,033 Cases and a Follow-up Study of the Patients Diagnosed Between 10 and 20 Years Ago. Radiology, **14**:38 (June) 1930.
4. Eusterman, G. E.: Diagnostic Aspects of Roentgenologically Negative Gastric Disorders. J.A.M.A., **107**:1432 (Oct.) 1936.
5. Editorial. Military Surgeon, p. 633 (June) 1943.
6. Giles, Roy G.: Skeletal Metastases from Primary Carcinoma of the Breast. Amer. J. Roentgenol., **14**:444-448 (Nov.) 1925.
7. Hinton, J. W.: Am. J. Surg., **20**:102, 1933.
8. Horner, John L.: Diagnosis of Gastroduodenal Disease. Med. Clin. N. Am., p. 489 (March) 1945.
9. Kirklin, B. R.: Duodenal Ulcer that May Escape Roentgenological Diagnosis. Med. Clin. N. Am., **15**:177-184 (July) 1931.
10. Miller, T. G.: The Causes of Indigestion and Their Recognition. New England J. Med., **224**:537 (March 27) 1941.
11. Rivers and Ferreira: J.A.M.A., **110**:2123 (June 25) 1938.
12. Tidy, Sir Henry: Peptic Ulcer and Dyspepsia in the Army. Brit. Med. J. (Oct. 16) 1943.
13. Wolfert, W. G.: Medical Record, **146**:519, 1937.

DISCUSSION (*Abstract*)

Dr. Vincent W. Archer, University, Va.—The more stomachs I see, and we see quite a number of them, (1,600 last year) the more I am worried about my ability to differentiate benign and malignant lesions in the prepyloric region of the stomach on the first examination.

May I give you an example? At the present time I have a dentist under observation who has a prepyloric lesion. He had a canalization of his pylorus over in an area of about 2 cm. in length. There was a definite small ulcer crater but there was also what looked like a thickening of the mucosa just proximal to this canalization.

In that type of case we are just relying upon the law of averages if we attempt to make a differential diagnosis on first examination.

As we tell students, the laws of average do not apply to the individual case. We are supposed to drive a million miles in our cars without having a fatal accident, and yet, if we have a fatal accident within the first five hundred miles, we are just as dead as though we had driven a million miles. In the same way when we are trying to evaluate prepyloric lesions, we cannot depend upon the law of averages for the individual case.

There are two courses open. If the lesion is unquestionably benign or unquestionably malignant, we might do as we have done in the case of the dentist. I thought that the chances were it was benign, from the symptomatology, since it had been going on for a period of years. On the other hand, all of us know that sometimes these malignancies, particularly prepyloric, will creep up on us. So I asked him to come back in ten days after following very strict medical treatment by a gastro-enterologist. Symptomatically he was very much better, and the ulcer crater looked as though it were definitely healing, but, again, following the work of Sara Jordan at the Lahey Clinic, we must remember that sometimes even malignant ulcers will heal under strict medical treatment. We asked him to come back in another two weeks, relaxing his very strict medical treatment, for reexamination and see whether there was any progression. There had not been. Symptomatically he was very much better at this time, and his radiological appearance followed his clinical improvement.

We are putting him off for another month unless he shows signs of slipping back. We cannot delay in prepyloric lesions, if there is any grave doubt. If there is doubt, we are thoroughly justified in an exploratory laparotomy. Nobody takes a negative exploration for suspected appendicitis as being anything out of the ordinary. That is to be expected, and not all suspected cases have appendicitis.

With the first attack of appendicitis, over one-half of the patients will recover, whereas, in malignancy, if the diagnosis is missed 100 per cent will die. Therefore, I believe that we should not rely upon the first examination of the stomach, particularly in prepyloric lesions. We should do either an exploratory laparotomy, or, as we have outlined, repeated very careful examinations.

Dr. Robert J. Reeves, Durham, N. C.—The internists bring cases in, especially gastric ulcers and prepyloric ulcers, often with an uncertain diagnosis. If we diagnose a gastric ulcer, they are not sure whether they should wait or have surgical intervention. I think we cannot stress too strongly the importance of check-up examinations, at two-week intervals for three, four, or six-week periods, after which many of them will heal.

Dr. Giles (closing).—We cannot be too careful in our reports upon prepyloric lesions, and also occasionally in our ulcer cases. I remember during the past three years I saw a boy, nineteen years of age, in whom on one occasion I found an ulcer. No ulcer could be demonstrated on the second or third examinations by giving small amounts of barium and using pressure.

I was able to demonstrate an ulcer again on the fourth examination, which was about 18 months after the ulcer was first demonstrated.

One of my friends, a Y. M. C. A. director, has been examined at least seven or eight times, over a period of 18 years giving a typical history of ulcer. At the last examination a few months ago I was able to demonstrate an ulcer. Twenty-one films were required in my examination.

So it is with prepyloric lesions. We must take all precautions and do repeated examinations when necessary, or when we are unable to say definitely whether the defect is an ulcer or a malignancy.

PERFORATED PEPTIC ULCERS IN NAVAL PERSONNEL*

By SHIRLEY C. LYONS, M.D.†
New Orleans, Louisiana
and
L. GORDON SINCLAIR, M.D.†
Raleigh, North Carolina

The widespread occurrence of peptic ulceration[1 2] and the high incidence in men in the age period which coincides with the period of greatest military service naturally results in a high incidence of the disease in military personnel. In fact, as several observers have pointed out, the daily sick call and the ready availability of medical treatment have resulted in a clearer revelation of the true incidence of the disease than civilian statistics indicate. The sum of these various factors is that ulceration of the upper gastro-intestinal tract furnishes one of the primary causes of medical disability in the military services and one of the chief problems which confront medical men in all branches of the armed forces.

SURVEY OF THE LITERATURE

Although comparable statistics from the last war are not useful, since the diagnostic methods now available were then either unknown or were just coming into use in civil practice and were not usually employed in the Army, the general category of digestive disease, presumably due to peptic ulceration in half or more of all cases, has proved a costly one for the American taxpayer.[3] Very early in World War II the problem of the dyspeptic soldier and of the sailor in the same category became acutely important for the British and Canadian armed forces.[4 6]

Two highly significant facts emerged from these various studies: (1) the high proportion of digestive disabilities due to peptic ulceration[4 5] and (2) the high proportion of peptic ulcers which were pre-existent.[4 5] Wade's conclusion concerning the Royal Navy seemed applicable to all branches of the armed forces, that the evidence did not warrant the idea that the disease had increased among service men. Rather, the expansion of the forces had resulted in the inclusion in them of affected personnel from the civilian population. Dental defects, which prevented satisfactory mastication of heavy food, and the heavy smoking indulged in by most soldiers and sailors were regarded as only partial explanations of the recurrence of symptoms after induction into the service. The basic explanation was that many if not all of the affected men had lived on careful and even strict diets in civilian life and could not tolerate the heavier diet of service life. Psychologic factors, at least at this stage of the war, were not regarded as of great importance. The disruptive effect of peptic ulceration on military efficiency was such that Hurst[7] made the flat statement that a man with a proven peptic ulcer, even though it was asymptomatic, should not be accepted for service.

The dyspeptic soldier and sailor also furnished problems in the Armed Forces of the United States. Theoretically no person with this disease was accepted for service.[8] For practical reasons, however, screening was ineffective and men with ulcers which existed prior to induction were found in all branches. Flood's study of peptic ulceration in the Army, and Hook and Keane's[10] similar study of naval personnel are smaller than the series reported by Walters and Butt,[11] who collected 1,352 proven instances (112 gastric, 1,219 duodenal, 21 gastric and duodenal) from thirteen naval hospitals in the United States for the two-year period ending December 1, 1942. One hundred thirty-one of these men had been returned to limited duty, and 654 to active duty; the remaining 567, more than 40 per cent, had been discharged, chiefly because of inability to tolerate a general diet. Surgery was performed in 103 cases, in 71 per cent of which the men were returned to duty, against 55 per cent returned to duty in the remaining 1,249 cases, in which the therapy had been medical. As the result of these findings, Walters and Butt concluded (1) that young men whose ulcers existed prior to their entrance into the Navy should be promptly discharged,

*Received for publication September 20, 1945.

*From the Station Hospital, Camp Peary, Virginia.

*The opinions or assertions contained herein are the private ones of the writers and are not to be construed as official or reflecting the views of the Navy Department or the Naval service at large (Art. 113 (2) U. S. Navy Regulations).

†Commander, Medical Corps, USNR.

and (2) that surgical measures in selected cases deserve a much wider trial.

PERFORATION OF PEPTIC ULCERS

Estimates as to the general incidence of rupture vary widely, from a minimum of 4 per cent to a maximum of 15 per cent. The majority are known to occur in males, estimates ranging as high as 90 to 95 per cent.

The mortality still depends fundamentally upon the time at which the patient is seen after the accident, and high death rates are still being reported. The older statistics, however, particularly those prior to 1940, should no longer be quoted as typical. Wakeley,[12] for instance, reported in 1944 that the over-all mortality of ruptured peptic ulcer in the British Navy had been reduced to 1 per cent.

Since the great majority of all ruptures of peptic ulcers occur in males, a high incidence of the accident would be expected in the services, yet most writers mention it only incidentally. Hook and Keane,[10] however, observed no fresh perforations in the ulcer material at the Naval Hospital in Oakland, although two men had had perforations prior to enlistment, two had suffered perforation in the South Pacific, and another had perforated on shipboard; during the course of the study two patients suffered perforated ulcers while they were under treatment on other services for other conditions.

ANALYSIS OF MATERIAL

The series of perforated peptic ulcers reported herewith consists of only 22 cases, but is being recorded for several reasons: (1) As already noted, though the potential seriousness and actual mortality of the accident warrants special consideration, it seems to have been discussed only incidentally in the various studies of ulceration in the British and American services. (2) All of the ruptures occurred within a few days to a few months after the men were inducted into the service. (3) Contrary to the general belief that patients with peptic ulcer, including perforated peptic ulcer, are unfit for military service, the majority of these men have been successfully returned to unrestricted duty.

The statistical data follow:

(1) The 22 patients were observed at the station hospital of a large training camp which during almost the whole period of the study was designated for the training of combat battalions (Seabees). The hospital admissions during the period in question numbered 50,219, and 269 special gastro-enterologic studies were carried out, as the result of which 170 men were discharged from the service.

(2) Fourteen ulcers were duodenal and eight gastric. Fifteen of the 22 patients had histories either absolutely typical or strongly suggestive of peptic ulcer, although only three were aware that they had the disease.

(3) The 22 ruptured peptic ulcers occurred between May 1, 1943, and April 2, 1945. The seasonal distribution, though on the surface highly irregular, actually corresponded to the rise and fall of the camp population.

(4) The age range was between 24 and 50 years, the average age being 35. Six patients were between 24 and 29 years, 11 between 31 and 38 years, and four between 40 and 46 years. The remaining patient was 50 years of age. The unusually high age levels for military service are explained by the fact that Seabees were on the average considerably older than men in other branches of the forces.

(5) All 22 ruptures occurred within a maximum of seven months after induction of the patients into service. Six had been in service between seven and 14 days, four between two and four weeks, four between one and two months, and the remaining eight between three and seven months. None had had foreign duty.

(6) Pain was the significant symptom in every case. It was always of sudden onset and it was usually extremely severe. In three cases it was referred to the shoulder. Vomiting occurred in 10 patients but was never prominent. Most of the ruptures occurred within a few hours of the last meal.

(7) The chief physical finding was rigidity, which was board-like in 19 cases and moderate in three. In four cases it was most marked in the right upper quadrant, in five cases in the right lower quadrant, and in one case over McBurney's point. Three patients, seen respectively two, five and eight hours after the onset of symptoms, were in deep shock.

(8) The white blood cell count ranged between 5,400 and 27,500 per cubic millimeter,

and in 15 cases was between 10,000 and 20,000.

(9) The lapse of time between the first symptom and the operation ranged between two and 34 hours, and averaged eight hours. Eleven patients were operated on within five hours, six within 10 hours, and the other five between 13 and 34 hours.

(10) Patients in shock were treated before operation by plasma transfusions, supplemented by intravenous infusions of glucose in physiologic salt solution. The remaining patients were operated upon as soon as they were admitted or transferred to the surgical service.

(11) Ether anesthesia was used in two instances. The remaining patients were operated upon under spinal analgesia, supplemented in six cases by ether vapor and in one by local infiltration. The right rectus or right paramedian incision was used in all cases, though in two a McBurney incision had first been made, on the incorrect diagnosis of acute appendicitis. The procedure in all instances was simple closure of the perforation; in 12 instances a portion of omentum was applied over the suture line. Sulfanilamide (microform crystals) was used in the peritoneal cavity in all cases, and in a number of cases in the wound also. Drainage of the peritoneal cavity was carried out in five cases.

(12) Postoperative therapy was routine in all instances, the basic reliance being upon continuous intestinal decompression; parenteral fluids, usually in the amount of 3,000 c.c. daily; and the parenteral administration by infusion of sodium sulfathiazole, in the amount of 5 to 10 grams daily, depending upon the course of the case and the blood sulfathiazole level. These special measures were continued as long as indications for them existed, usually for at least three days.

(13) The single death in the series occurred in a 36-year-old man, in service for 10 days. He had had gastro-intestinal episodes, undoubtedly due to ulcer, for the past two years, and it was learned, after operation, that he had had an exacerbation of pain and had observed blood in the stools for a week before rupture occurred. He was the only patient, incidentally, who had premonitory symptoms. The first physician who saw him, following the classic onset of symptoms and signs, made a diagnosis of ruptured peptic ulcer. By the time the patient reached the hospital rigidity had disappeared and he was quite comfortable; the second physician who saw him therefore advised observation. When acute symptoms recurred he was seen by a surgeon, but 21 hours had then elapsed since the accident. A perforation on the anterior gastric surface at the pylorus was closed under spinal analgesia and ether vapor; sulfathiazole was left in the peritoneal cavity, which was extensively contaminated. The postoperative status was never satisfactory. Fever was persistent. Pneumonia developed on the fifteenth day, and was followed by intractable distention, which could not be controlled by constant intestinal decompression. On the thirty-fifth day a large pocket of pus in the left lower quadrant was drained, and ileostomy was performed. Death occurred two days later.

(14) Of the 21 surviving patients, nine made uncomplicated recoveries. Two had wound disruptions, in one instance complicated by pneumonia, six others had pneumonia, in one instance combined with a wound infection, and four others had wound infections. None of the pulmonary complications was serious.

(15) Of the 20 survivors operated upon sufficiently long ago to warrant a report of their status, five were discharged, three were returned to limited duty, and 12 were returned to full duty, the period of observation to date ranging from seven to 30 months.

Thirteen of the 20 patients had histories suggestive or typical of pre-existing ulcers. Two of the 13 were promptly discharged from the service, because of persistent symptoms, revealed by roentgenologic examination to be due to a persistent ulceration of the duodenal cap in one case, and to a second (gastric) ulcer in the other. The three patients with ulcer histories who were returned to limited duty have remained free from symptoms for nine, 18 and 30 months respectively. The seven patients with ulcer histories who were returned to full duty have remained well for periods ranging from seven to thirty months; three have served under combat conditions.

Of the eight patients without previous ulcer histories three were separated from the service because of persistent digestive symptoms, the

fourth for other disabilities. The other four men in this group were returned to full duty and have remained well for twelve to eighteen months, in one instance under combat conditions.

COMMENT

Since the death rate in ruptured peptic ulcer depends above all on the lapse of time between the onset of symptoms and operation, prompt diagnosis is of the greatest importance. There were no diagnostic difficulties in 19 of these 22 cases, in all of which the picture was classical. The other three cases were diagnosed as acute appendicitis, chiefly because of localizing signs in the right lower quadrant. The confusion obviously arises from the spill of duodenal contents down the right paracolic gutter and their later collection about the cecum.

Roentgenologic examination might have been useful in these latter cases, but was not performed because it was confidently believed that the diagnosis in each was acute appendicitis. It was not employed in any of the remaining cases because the diagnosis was clear without it.

During the period covered by this study two operations were performed on an incorrect diagnosis of ruptured peptic ulcer. One patient had mesenteric lymphadenitis and the other, although the presence of a duodenal ulcer was later confirmed by roentgenologic examination, had no demonstrable perforation. For such "unnecessary" explorations we have no apologies. The single fatality in the series, which occurred in a patient observed for an undue length of time for diagnostic reasons, lends support to the policy of prompt exploration in all cases of obscure abdominal symptoms, even in the absence of a definite diagnosis. Incidentally, it also proves the wisdom of repeated observations by the same physician. In our opinion, neither the type of incision nor the type of anesthesia makes any difference.

The type of operation is a matter of the greatest importance. Although comparative statistics are frequently cited to prove that simple closure gives less good immediate results than does the more radical operation of gastrectomy, the figures are misleading and the explanation is obvious: simple closure, even in clinics in which both closure and gastrectomy are practiced, is always chosen for poor risk patients and naturally seems to give poorer results than does an operation always performed upon good risk patients and seldom performed by any but competent surgeons.

In our opinion neither gastrectomy nor gastroenterostomy is indicated in the management of ruptured peptic ulcer, regardless of the findings at operation, but rather is definitely contraindicated. As Graham[13] has so well put it, the only responsibility the surgeon has to a patient with a ruptured peptic ulcer is to save his life.

If gastrectomy or gastro-enterostomy should be indicated in any case of ruptured peptic ulcer, the patient's interests are best served by immediate closure of the perforation and the performance of the additional surgery at a later elective date, when the risks to which rupture has subjected the patient have been eliminated. Guthrie and Sharer's[14] statistics clearly show the wisdom of this plan.

The use of an omental tag to cover the defect in the stomach or duodenum after it has been closed is an additional precaution, which many observers[15] consider extremely important, though we ourselves are less convinced of its value.

Although drainage was used in five cases in our series, it probably could have been omitted with profit in all. We regard it as significant that four of the five patients drained developed complications and had stormy convalescences. With the increasing use of intraperitoneal chemotherapy, the tendency is increasing to close the abdomen without drainage, on the sensible ground that regardless of the amount of contamination, a drainage tube drains only the immediate area in which it has been placed.

Prophylactic appendectomy is mentioned only to be condemned. In spite of some good reported results[16 17] additional operation, in a contaminated field, on a seriously ill patient, introduces an additional and entirely unwarranted risk.

Why all the ruptures in this series occurred so soon after the men were inducted into the service cannot be adequately explained, though three possible reasons suggest themselves:

(1) The change of environment and mode of life may have played some part. The statistically significant increase in perforations in London during the period of the blitz[18 19] was

explained not only by dietary irregularities and changes, but also by factors of unrest and anxiety. While it is possible that the same psychic factors may have been operative in a milder form in our group of patients, we question the reasoning. Although neuropsychiatric studies were not carried out, these men were particularly well adjusted, and it should be emphasized that 21 of the 22 were Seabees, who volunteered for service and were not drafted.

(2) The change in the character of the diet undoubtedly played some part. The American Armed Forces were the best fed forces in the world, but at that although the food was plentiful, nourishing, and usually as well and as attractively cooked as food can be which is prepared in quantity, it was definitely a change, both qualitatively and quantitatively, from the food of civilian life. Whatever its values, it was not the type of food which a patient with digestive disturbances usually selects. Alcoholism was not a factor in any of the 22 cases.

(3) The effect of unaccustomed activity must also be considered. The majority of these men were carpenters, mechanics, and construction workers of various sorts before they entered the Navy, and they were used to hard work. But the 14-hour-daily program of a boot camp involved violent physical activities totally different from the activities of civilian life.

While external trauma is not accepted, either medically or legally, as a cause of peptic ulcer, traumatic perforation of an ulcer would seem analogous to traumatic appendicitis, which is accepted by most surgeons and is now a legal cause of industrial compensation in many states, as well as of liability by insurance companies. It must be granted that some of the reported cases of traumatic perforation of peptic ulcers are entirely unconvincing and that in most instances the reasoning is little more than *post hoc ergo propter hoc*. The cause and effect relationship in some cases, however, seems beyond doubt. No story of external trauma other than unusual physical activity was elicited in any case in this series.

SERVICE POLICIES

A review of the literature on peptic ulceration in the armed forces and the analysis of our own cases permit certain conclusions as to the future policies concerning this disease, first as it occurs in men called for service, and second as it occurs in men already in service, with particular respect to perforation.

Other things being equal, and in the absence of highly specialized training for which a special need exists, it would seem in the best interests of the military services to refuse to accept for service any man who certainly or probably has a peptic ulcer, for reasons of economy as well as of efficiency.

The circumstances of military life were not the circumstances in which a patient with a peptic ulcer ordinarily remains free of symptoms. Aside from medicinal measures, he requires (1) frequent feedings of simple food (vividly described as a diet suitable for a growing child), and (2) freedom from tension of every sort, including fatigue and emotional stress and strain. Officers and men on limited duty could perhaps exercise some control of their diet, but enlisted men could not, and even on limited service a serene way of life was practically impossible to attain. Furthermore, a soldier or sailor with a peptic ulcer always was in danger of hemorrhage or perforation, which might occur at times when medical and surgical care might be difficult if not impossible to secure, and when his trained services were most essential.

On the other hand, the acute problems of perforation and hemorrhage are, generally speaking, much less difficult to manage than are the chronic manifestations of ulcer. Therefore the problem of what to do with a man who presented a perforated ulcer was somewhat different from what to do with a man who presented recurrences of ulcer symptoms. Our own opinion was that a selected number of men with perforations could remain in the service and were likely to continue at full effectiveness. The results in this small series of cases substantiate this point of view, and there are other arguments in favor of the policy.

In the first place, the percenatge of re-perforation is small.[20 21] In the second place, as Williams[21] pointed out in a follow-up study of 100 perforated ulcers at the Boston City Hospital, what happens in the first six months after operation is a clue to what is likely to happen in the future, while if a patient is symptom-free

for a year, the chances of later recurrence are small. In our own series, 11 of the 12 patients returned to full duty remained free of symptoms for periods ranging from 12 to 30 months, and two of the three patients returned to limited duty were free of symptoms for 18 months each, at the time of writing.

Finally, although many observers scout at the idea, there does seem some basis for the rather common belief that a patient with a perforated ulcer who survives the perforation is likely to fare better in the future than a patient who has not suffered such an accident. The anatomic reasons for this concept are excellently set forth in a recent editorial in the *Lancet*.[22]

Wakeley[12] has recently published statistics which fully support the idea that a patient with a perforated peptic ulcer may be usefully retained in the Navy. It might be added that simple closure was done in all of his 103 cases. He concluded, quite reasonably on the basis of his results, that naval personnel with ruptured ulcers should not uniformly be invalided out of service, but on the contrary, following convalescence, should be returned to duty and would be likely to remain useful members of the service. He further concluded that the policy of refusing for service all men with a history of perforation is unwarranted, on the ground that the prognosis is actually better in this than in any other variety of peptic ulcer.

SUMMARY AND CONCLUSIONS

(1) A high incidence of peptic ulceration would naturally be expected among military personnel, in view of the frequency of the disease, the predominance in men, and the coincidence of the period of greatest military service with the age period in which the disease is most frequent. A high incidence of perforation would also be expected in military personnel in view of the major frequency of the accident in men.

(2) The literature of the military services is frequently concerned with the ulcer-bearing serviceman, but surprisingly little has been written about perforation under these circumstances.

(3) Although the policy of Selective Service in the United States was to screen out all candidates with proven ulcer, and to investigate those with suspected ulcer a large number of ulcer bearing subjects were taken into service or developed ulcers after they had been inducted.

(4) The same general rules cannot be laid down for the management of military personnel with perforated ulcers and of those with recurrent symptoms of chronic ulcers. Of the two problems, the former, though at the time of occurrence it represents a grave emergency, is more easily solved.

(5) The diagnosis of ruptured peptic ulcer is usually not difficult and can be made clinically in most cases. Prompt operation is the keynote of success. The procedure should include only simple closure of the ulcer; additional surgery, if indicated, should be performed at a later elective date. Postoperative therapy is based chiefly on constant intestinal decompression, chemotherapy, and the judicious use of parenteral fluids, including plasma and whole blood.

(6) After recovery from the operation, patients whose symptoms persist and in whom roentgenologic study shows persistence of ulceration should be promptly discharged. Patients who present only minor symptoms can be tentatively returned to limited duty. Patients who are free from symptoms can be returned to full duty, with the reasonable expectation that they will remain well and will prove useful members of the service.

(7) These conclusions are based on a survey of the recent British, Canadian and American literature and upon an analysis of 22 personally observed cases of ruptured peptic ulcer in a naval training camp. Of 20 men observed sufficiently long to permit conclusions, 12 were returned to full and three to limited duty, and all have been serving without subsequent disability for periods ranging from seven months to two and a half years. A unique feature of the series is that all ruptures occurred shortly after the men were inducted into service, in 14 instances between 7 days and two months after induction.*

---

*After this article had been completed, there came to hand the April, 1945, issue of *The Military Surgeon*, which contains an article by Major William B. Harrell and Captain Robert Wilson, Medical Corps, Army of the United States, entitled "Ruptured Peptic Ulcer among U. S. Troops in Panama (Report of Ten Cases) (96:336-342). The ages of the 10 patients ranged from 20 to 33 years, and the lapse of time between the onset of symptoms and operation ranged from two to 33 hours but was less than six hours in nine cases. Simple closure, with an omental tag, was done in every case. There were no fatalities in the series. All 10 patients, following their convalescence, were returned to the United States, with the recommendation that they be discharged from the Army on certificate of physical disability. Four had previous ulcer histories.

REFERENCES

1. Portis, Sidney A.; and Jaffe, Richard H.: A Study of Peptic Ulcer Based on Necropsy Records. J.A.M.A., **110**:6, 1938.
2. Deaths from Each Cause, United States, 1940-1943. Vital Statistics, Special Reports, **21**:73, 1945.
3. Kantor, John L.: Digestive Disease and Military Service; with Special Reference to the Medical Department of the U. S. Army. J.A.M.A., **120**:254, 1942.
4. Payne, R. T.; and Newman, Charles: Interim Report on Dyspepsia in the Army. Brit. M. J., **2**:819, 1940.
5. Lane, R. A. G.: The Peptic Ulcer Problem. A Series of 181 Cases from the Royal Canadian Navy. Canad. M. A. J., **50**:353, 1944.
6. Wade, Henry J.: Dyspepsia in the Royal Navy. Study of 1003 Consecutive Cases. Lancet, **2**:636, 1942.
7. Hurst, A.: Digestive Disorders in Soldiers. Am. J. Digest. Dis., **8**:321, 1941.
8. Rowntree, L. G.: Personal Communication.
9. Flood, Charles A.: Peptic Ulcer at Fort George G. Meade, Md. War Med., **3**:160, 1943.
10. Hook, F. R.; and Keane, R. H.: The Plight of the Ulcer Patient in Military Service. Study of 306 Enlisted Personnel with Duodenal Ulcer. U. S. Nav. M. Bull., **44**:519, 1945.
11. Walters, Waltman; and Butt, H. R.: Management of Ulcers Among Naval Personnel. Ann. Surg., **118**:489, 1943.
12. Wakeley, Cecil P. G.: Late Results of Perforated Peptic Ulcer. Lancet **1**:11, 1944.
13. Graham, Roscoe R.: The Treatment of Perforated Duodenal Ulcers. Surg., Gynec., & Obst., **64**:235, 1937.
14. Guthrie, Donald; and Sharer, Robert R.: Permanence of Cure Following Ruptured Duodenal Ulcer, J.A.M.A., **107**:1018, 1936.
15. Thompson, Harold L.: Acute Perforation of Peptic Ulcer. Immediate and Late Results in Five Hundred Cases. J.A.M.A., **113**:2015, 1939.
16. Burden, Verne G.: Acute Perforated Duodenal Ulcer. Am. J. Surg., **63**:61, 1944.
17. Cox, Oliver C.: Perforated Peptic Ulcer. A Suggested Method of Treatment. M. Ann. District of Columbia, **9**:202, 1940.
18. Stewart, D. N.; and Winser, D. M. deR.: Incidence of Perforated Peptic Ulcer. Effect of Heavy Air-Raids. Lancet, **1**:259, 1942.
19. Spicer, C. C.; Stewart, D. N.; and Winser, D. M. deR.: Perforated Peptic Ulcer During the Period of Heavy Air-Raids. Lancet, **1**:14, 1944.
20. DeBakey, Michael: Acute Perforated Gastroduodenal Ulceration. A Statistical Analysis and Review of the Literature. Surgery, **8**:1028, 1940.
21. Williams, A. C.: Perforated Peptic Ulcers. New England J. Med., **230**:785, 1944.
22. Perforation of Peptic Ulcers (Editorial). Lancet, 1:19, 1944.

ESTROGENIC HORMONES, OFTEN ONLY A PSYCHOTHERAPEUTIC AGENT*

By JOHN D. WEAVER, M.D.†
Austin, Texas

As one studies infant and maternal mortality, as well as vital statistics in general, he can say without reservation that medicine has made great progress. However, the physician must be fully aware that the laity is rapidly gaining control and dominating his profession. Insurance companies are setting his fees, social workers tell him whom he can treat, detail men tell him how and what to use in treatment; not to mention the control of his workshop, the hospitals and medical schools. As a general practitioner in private practice and, more recently, as a full-time teacher in a state university, I have had ample opportunity to study this appalling situation. These are some of the factors that are taking away from the medical profession many of the important things that aided most men in the decision to become doctors. Since the beginning of time each generation of physicians has believed that its knowledge, methods, and medicinal agents were superior to those of its forefathers. This generation suffers from the same egotistical point of view. Not infrequently we hear a student say, "Would not grandfather be lost if he tried to practice medicine today?"

Grandfather would probably do a much better job of taking care of our patients than we would of taking care of his. He had to make a diagnosis. We have vitamins, sulfa drugs, penicillin, and hormones; with magic drugs such as these we do not bother with a diagnosis. We may criticize grandfather's "shot-gun" prescriptions, but if we pick out ten charts in any hospital record room and read the order sheets, it is easy to see that medicine has not changed. It is just a different bunch of boys with more powerful ammunition.

Among these "wonder drugs," which have made it unnecessary to make a diagnosis, and which are given in many cases without even an examination, we find near the top of the list the estrogenic hormones. Time and space will not permit us even to list the many conditions for which these preparations have been used. In our own clinic we have not found them to be the panacea for treatment of all the complaints a woman has throughout her life. As a matter of fact we have found very few indications for the use of the estrogens, and often when they were employed their results did not compare with those of other drugs. Many workers maintain that physicians who do not use hormone therapy employ far more radical treatment, namely, operative procedures. Every case of unexplained vaginal bleeding that occurs on our service or in the outpatient clinic, particularly in women past 40 years of age, is subjected to thorough examination. This includes a bimanual examination under anesthesia if necessary, biopsies, and diagnostic curettage. In spite of

*Read in Section on Gynecology, Southern Medical Association, Thirty-Ninth Annual Meeting, Cincinnati, Ohio, November 12-15, 1945.

†Assistant Professor in Department of Obstetrics and Gynecology, University of Texas School of Medicine, Galveston, Texas.

this, our proportion of operative procedures has been comparatively small.

Between December 1, 1942, and October 1, 1945, a total of 34 months, we have had 27,746 visits of new and old patients in the gynecologic outpatient clinic. During this entire period of time only 1,634 patients have been subjected to operative procedures that required hospitalization (*Table 1*).

From these figures I believe that unnecessary operative procedures have not been done. The day before patients are taken to the operating room, except in an emergency, they are given a careful gynecological examination by a group which includes the house staff, instructor and the senior medical students on the gynecological service. Indications for the operation are openly discussed, and the patient's operative condition is evaluated. These preoperative meetings have aided materially in preventing unnecessary operative procedures. The private patients are also assigned to students.

It is almost routine for our patients to inquire after operation, "When do you start my ovarian shots?" Many of them request some such treatment when no ovarian tissue has been removed. Some of them seem to be amazed when we tell them they do not need it, and that we do not use it. Before our patients leave the hospital we explain to them the uselessness of postoperative estrogenic hormone therapy. During the time of this study we have given estrogenic hormones postoperatively to only 13 cases.

TYPES OF OPERATIONS

Panhysterectomies, with or without bilateral or unilateral salpingectomies and oophorectomies	188
Supravaginal hysterectomies with or without bilateral or unilateral salpingectomies or oophorectomies	324
Vaginal panhysterectomies, with or without unilateral salpingectomy or oophorectomy	47
Bilateral or unilateral salpingectomies and oophorectomies	108
Total	667
Dilatation and curettage	305
Vaginal repairs	112
Tubal sterilizations	76
Radium implantations	70
Miscellaneous: amputations of stump, fistulae repair, conization of cervix, biopsies, colpotomies, drainage of abscesses, removal of cysts, and so on	404
Total	967

Table 1

We have done 209 bilateral oophorectomies. Of these 13 cases, three of them, who were apparently stable colored women, were told purposely that they would have to take some female sex hormones after they went home. All three of these women have insisted on continuing this treatment in spite of the fact that it was only suggestive therapy in the beginning.

In our patients at the clinic, and in the private practice of one of our staff, not a single case of atrophic vaginitis has been seen in totally castrated women of the childbearing age.

We believe that when women are subjected to operative procedures involving their female sex organs, there is a definite psychic reaction. They have been told by some neighbor, friend or mother that once they have their female organs removed they will become fat, lazy, disinterested, and develop a negative libido. They may be a little doubtful of this until their doctor begins to give them sex hormones, when he thus removes the doubt the patient is well on her way to the need of a neuropsychiatrist.

We believe surgical or natural so-called menopause is largely a psychic reaction either psychoneurotic or depressive. From the time the little angel is born, the kind, sacrificing, doting mother devotes a great deal of her time to informing her daughter of the tremendous price she must pay, simply because she is a woman. The daughter is told how much pain she will have when she menstruates; how weak she will become because of the loss of blood; how nervous and irritable she will be at that time; the pain, discomfort, and horror she will experience with coitus. Of course, this is not the worst. When she goes through the change she is really going to suffer. She will probably bleed badly, and she will have headaches and vertigo for days. She will have hot and cold sensations, but worst of all, she will gain weight, she will have wrinkles in her face and bags under her eyes, her hair will turn gray, her teeth fall out, her breasts become floppy, her buttocks begin to sag, her knees get boggy, and she will lose her libido. Not only that but that is about the time that Bill will begin to run around with some young hussy. It is just about that time in life, too, that he just does not seem to understand how nervous and upset she is. And on top of it all the poor

girl is frequently reminded of some poor neighbor, friend, or acquaintance who went insane while going through the change. Every daughter respects her mother's opinion, and it is easy to imagine why this information may develop psychic reactions in even the stable normal person, not to mention what it may do to a neurotic.

During the past three years there have been admitted to the University hospital, on the neuropsychiatry service, over 2,200 women. According to Dr. Titus Harris, over 1,670 of these women have received estrogenic hormones. If the patients are under 25 years of age the usual indication, according to the patient's statement, was "weak ovaries"; if over 25 years of age, it is an "early" or "late change."

Prior to the purification of the estrogen many of these women were treated with oral ovarian substances, which have been proven practically inert. Many biological houses have discontinued the manufacture of such products in spite of the fact they frequently have orders for them from physicians.

Ten years ago when women were first given estrogens for so-called menopausal symptoms, the amounts used were surprisingly low, 10-15 units. In spite of such ineffective dosage, doctors reported excellent results.

On repeated occasions one of us (Cooke) has obtained sterile oil in ampoules, changed labels so that the patient could see that it was the same substance, and given her the contents. He obtained the same results from the placebo as from the estrogen. If he gave her the same unitage, or dose, of estrogen, but of a different brand, she would state that it was not effective, or relate some unusual condition that the new preparation produced.

Similar work has recently been reported on a large series of cases with the same results as Cooke obtained, by Bennett of Omaha. He too used potent and inactive solutions with equal results. Surely the results obtained are simply on the basis of psychotherapy. But this is the very poorest type of psychotherapy. It creates a tremendous conflict in the patient's mind. She may have some mild depressive state that in some way may be associated with oligomenorrhea, amenorrhea, or even meno-metrorrhagia. There may even be some cardiovascular changes noted. Due to this type of conditioning training, she immediately begins to associate all of her symptoms with her female sex organs. To treat this woman with estrogens, according to Weisz, may be likened to a double-edged sword. She goes to the doctor in doubt, or perhaps only apprehensive, that some vague symptom she may have had could be explained on the basis of dysfunctioning ovaries. If he treats this woman with sex hormones he removes the doubt, completely fixing in her mind that all of her trouble is due to her weak organs. Therefore, she must come to his office one to five times a week and get her shots in order to supply her with that which her ovaries are not strong enough to give her. There is no question in her mind; her doctor told her so. Most of these women are seldom allowed to take oral estrogens. One of the important reasons for parenteral estrogens is the desire, the folly, or the unexplained pleasure that this type of person obtains in going to the doctor's office. Anything that she can take at home does not have the psychotherapeutic effect of a visit to the doctor even though his hypodermic is a placebo. After treatment of this kind for some time, she fixes in her mind a definite relationship between any organic or functional symptom she may have, and her female organs. When the time actually comes for her to obtain neuropsychiatric advice and treatment it is exceedingly difficult to convince her that her sex organs were not the etiological factor producing her present state of health. Hence, the other side of the sword.

The administration of estrogens to this type of patient has not only prolonged but definitely accentuated her mental illness. However, the real tragedy lies in the fact that from the very beginning of this illness she has had her mind focused on her sex organs. She builds up an imaginary chain of symptoms which makes it difficult for even the well-trained conservative operator to refrain from a laparotomy.

For three years it has been my privilege to see in consultation many patients in the neuropsychiatric service. With none of these patients do we discuss the pelvic pathology. Once she is told that she has a cystic ovary, a slightly enlarged tube, or "a sore on the mouth of her

womb," or that the "womb has grown fast to the backbone," she has heard all that she wants to know. She immediately begins to look for a surgeon, and she judges his ability in direct proportion to his fee. So the doctor begins the series of operations. After a while he has removed all of her female organs except the vagina; and then he begins on her adhesions. It is not unusual to find six to eight scars on the abdomen of these women. By this time he is giving her enough hormones to balance her, and I do mean balance. Along about this time, fortunately for the patient, the old mortgaged homestead has had all the operations it can stand.

We have retraced this course of events in the histories of so many patients, that we believe it worthwhile to stress the fallacy and injustice of such treatment.

Of course, we realize that for the last ten years the hormones have been the "breadwinners" for the medical profession. The office girl goes down early and gives all of the "shots" and gets that group of patients out of the way, before one starts the day with the important cases. Remember, I was in private practice before beginning to teach. So week after week, month after month, and year after year, without seeing her doctor, the patient continues to go for her shots. Many of these patients are from their middle thirties to their middle fifties. This is the period of life in which serious organic diseases may develop in the form of cardiovascular renal disease, hepatic disease, and so on, to say nothing of the malignancies that occur in the uterus and breasts of patients of this age.

Last year in our clinic in a period of six weeks we had three women who died of cancer of the uterus who had been taking shots from the office girl, one of them for three years. All three of these women had had meno-metrorrhagia for over a year, and not a single one, according to their stories, had had a pelvic examination.

Another interesting case was a woman admitted on our service a few weeks ago complaining of vaginal bleeding. She was 65 years of age, and had been seen by six physicians during the previous five years. The recurrence of bleeding came after twelve years of amenorrhea. The first five doctors did not do a pelvic examination, but each one of them prescribed or gave estrogenic hormones. The last physician, who sent the patient to the hospital, examined her and found a polyp hanging out of her vagina. The "shoeshine boy" could have recognzied the etiology of her bleeding.

The work of Zondek on male mice, the appearance of breast cancer in women after estrogens have been used, the rapid development of cancer of the cervix in a woman who has a leukoplakia makes this drug, if nothing more, most interesting as possibly containing a carcinogenic factor.

We are not to be misunderstood. We do use this drug for juvenile gonococcal vulvovaginitis, senile endometriovaginitis, hypoplasia of uterus, cramping uterine dysmenorrhea (tentatively), postpartal breast engorgement, some types of habitual abortion, and its effect on ovulation. But, we believe that estrogenic therapy as used today is too often only a psychotherapeutic agent.

1209 Guadalupe Street

DISCUSSION (*Abstract*)

Dr. Waverly R. Payne, Newport News, Va.—Dr. Jean Paul Pratt, some years ago appeared before this section at our meeting in New Orleans with a paper on this same subject. He reported that in his clinic the use of sterile oil and other placebos often accomplished the same good results as the use of estrogenic hormones.

I should like to emphasize, as Dr. Weaver has, the importance of complete examination of these patients before any kind of therapy is instituted. In other words, the patient who consults you because she is having so-called menopause symptoms should first of all be considered as a medical problem, and should have a thorough examination. This examination should include a careful history, physical examination, and laboratory studies with special reference to the basal metabolism and blood. The indiscreet use of the estrogens has led to many disasters.

Too often these patients are given weekly injections by an office nurse over long periods of time without having had the benefit of a pelvic examination. I have recently had the experience of seeing a patient with advanced carcinoma of the cervix who was thus badly managed.

Several observers who have condemned the routine use of estrogenic hormones have suggested the use of various sedatives. That attitude is not without danger.

I have seen several cases of rather severe bromide

poisoning with psychosis in patients who had been treated too long with bromide mixtures. In one instance the bromide level was 320 mg.

Several years ago a report came out from one of the state hospitals in North Carolina indicating that a rather large number of middle aged women admitted there, supposedly with involutional psychosis, were the victims of bromide poisoning. There is a way to handle most of these cases, and with the proper individualization much can be accomplished by the judicious use of estrogenic hormones.

Dr. Lee F. Turlington, Birmingham, Ala.—Many members of the profession are not thoroughly conscientious in studying their cases and a great many injections are given that are not necessary.

Since nobody else would get up to defend the position of hormones, I feel I must say something about them. I do not wish Dr. Weaver to make you think that there is nothing in hormone therapy. Estrogens are indicated in quite a number of cases, and I think that some of the other hormones are worthwhile.

Dr. F. O. Plunkett, Lynchburg, Va.—Just how are you going to eliminate all this indiscriminate use of therapeutic estrogens and other drugs? It goes back to better-trained doctors. It is not the doctors' fault; it is our educational institutions and our professors.

Dr. Erwin Straehley, Jr., Cincinnati, Ohio.—Another little machine, which I call a coffee can and others call a basal metabolism machine, is also used and abused.

Some years ago I took out the goiter of a woman. Many years later she went to a very good hospital. She had basal rate according to her slip of plus 58. She came in complaining of hot and cold flashes. I said, "Do you know what you would look like if this were true, this basal rate?" Then I had another basal rate taken on her. It was minus 3. I said, "I feel very much complimented that they did not see my goiter incision. After a few injections you will be all right."

This case was an ovarian disturbance.

Dr. Weaver (closing).—When I saw the program that was sent me for today, I sat at the 'phone and called the best friend I ever had, from South Bend, Indiana, to come down to discuss my paper. I did not want Dr. Dabney and Dr. Long to hear it alone. I read this paper to him last night, and he went home on the first train this morning.

Yes, Dr. Turlington, I would hate to practice medicine today without hormones. I started with estrogens when I was with the Eli Lilly Company during my medical school days in 1934, in charge of buying all the urine. We made some money at it when they put out the oral synthetic product.

Dr. Plunkett is exactly right. Everything that has been said about hormones has just about been disproved, and we are doing the best we can.

MANAGEMENT OF SOME COMMON OBSTETRICAL COMPLICATIONS IN GENERAL PRACTICE*

By HOYT L. CHOATE, M.D.
Little Rock, Arkansas

The parturient woman's cry for help has aroused her attendants to pulse quickened attention since long before Jacob's beloved Rachal labored, bled and died on the arid trans-Jordan Plateau. Men have endeavored throughout time to alleviate her sufferings by incantations, by sacrifice to the gods and by research. It is pleasing to know that many of her difficulties are amenable to present day methods and more pleasing to think the not too distant future will open its doors and shed light on such mysteries as the toxemias.

The purpose of this paper is to outline some procedures which have proved useful in the varied complications of an obstetrical practice. It will of necessity cover a multitude of subjects briefly, emphasizing those procedures which have been of real value in time of trouble.

We shall begin with the young woman who comes to your office early in her pregnancy. Our first complication is the early toxemia characterized by nausea and vomiting. Treat it vigorously to prevent the more serious hyperemesis. It is essential to do a complete physical examination. The numerous minor conditions such as anemia, infections, tumors, even poor mental attitude need to be noted. Nausea is more severe as a rule in the woman who has retrodisplacement than in that individual who is normal. The patient resenting pregnancy must be encouraged. Have her tell the family and her friends at once. I have found this alone will aid materially. More than 98 per cent of them will prove minor on an exact routine which should be written out for their direction. The following outline has proved very successful in our hands.

"Avoid as much as possible nervous excitement, worry over household duties, care of children, business problems, or fatigue from any cause. The patient must have

*Read in Section on General Practice, Southern Medical Association, Thirty-Ninth Annual Meeting, Cincinnati, Ohio, November 12-15, 1945.

at least eight hours of sleep each night and two or more hours of sleep or rest each afternoon. Sexual relation is avoided at this time because it increases nausea. Fresh air is helpful. Hot or crowded places filled with smoke or odors of cooking should be avoided as much as possible."

Restful sleep is induced by phenobarbital or some similar hypnotic drug.

The diet is divided into six daily feedings, none of which is omitted even if the patient is not hungry or is nauseated. The early morning feedings are mostly dry foods, cereals, toast, jelly. The other feedings allow variations to meet the patient's taste. Carbohydrates predominate, fats are low, proteins moderate.

In the more severe nausea cases, especially with a degree of acidosis dextrose, saline, absolute rest and sedation are indicated. Two medicaments should be stressed, pyridoxine hydrochloride and adrenal cortex.

The period comprising the second and part of the third trimester is usually her happiest time, during which she grows in weight and strength and mental tranquility. The late toxemias commonly make their entrance here in the latter two-thirds of the last trimester.

The patient who has enjoyed an uneventful course up to this time begins to gain weight excessively even though the diet is not abnormally large, the feet and ankles swell and the blood pressure rises but not alarmingly. The urine may or may not show albumin. These are early signs of preeclampsia. Treat her vigorously. It may save disaster. The standard treatment of bed-rest, sedation, limited salt and catharsis is indicated. Watch the urine output. Dr. DeLee said "40 ounces of urine per day and no convulsions."

Many will improve and continue a nearly normal pregnancy. Some will not improve and severe preeclampsia ensues. This case needs hospitalization when possible. If the patient is near term, labor should be induced as soon as the condition permits. Fortunately most of such cases induce easily and labor is more rapid than for the normal individual. Good sedation during labor will help ward off convulsions. Caudal anesthesia is remarkable in these cases. The blood pressure falls markedly and does not rise again to high levels. In eclampsia try to control convulsions before inducing labor. Medical induction plus rupture of the membranes will usually suffice. The second stage of labor should be shortened by low forceps delivery to prevent excessive straining. The woman with a small pelvis, a primipara with long and rigid cervix, or the elderly primipara may need other methods of delivery. These factors must be known in advance.

The step by step treatment of the eclamptic is omitted because it is well known and very nearly standard. My experience in the management of convulsions with veratrum is too limited for an evaluation. I hope the discussion will add something on the subject of this drug.

Nephritic toxemia begins earlier and advances more slowly. The history may be suggestive. It is less easily controlled but will often give one a false sense of security because the blood pressure rises slowly and the patient does not appear very ill. It is usually non-convulsive. If allowed to progress too far so much kidney damage is done that the patient's whole future life may be seriously damaged and markedly shortened. If a definite nephritis exists it is unwise for her to have any future pregnancies. Operative deliveries from above are more indicated in this form of toxemia than in eclampsia.

One of the most trying problems in obstetrical practice is the long labor. The patient and her family become exhausted, and so does the medical attendant. This condition may be due to a mild disproportion between the baby's head and the mother's pelvis, to inelastic or fibrous cervix, to tumors, to faulty position of the baby, or more commonly to ineffectual contractions of the uterine musculature. The uterus overdistended with a large baby often cannot contract efficiently. Time is necessary. Protect the patient with carbohydrates in the form of sweetened juices, dextrose intravenously and mild sedation. Deep sedation increases the length of labor. The dehydrated patient is not an efficient laborer. Good mental hygiene is essential and the doctor can give much encouragement to his patient with very little effort or time on his part.

If the slow labor is due to a faulty position of the baby as in occiput posterior or transverse arrest of the head, a breech or a face presenta-

tion, the same supportive measures are needed. Delivery can be effected only after the cervix is dilated or dilatable.

The Keilland forceps will save one much time and grief in transverse arrest of the head and occiput posterior positions which are not corrected manually with ease. "Pituitrin" is a very dangerous drug to use in the long labor.

Occasionally an ovarian cyst may slip into the pelvis and cause dystocia. I remember such a case in a multipara. The baby's head could not enter the lower pelvis until the cyst was punctured through the posterior fornix with a needle and 100 c. c. of straw-colored fluid evacuated. A small fibroid in the cervix once gave a patient a long first stage. This pecan sized tumor was pushed over the baby's head and delivery effected normally.

The most spectacular of obstetrical complications is hemorrhage. Directly and indirectly it is the cause of a high percentage of maternal mortality and morbidity. The anemia produced often decreases the resistance against infection and we experience grave complications after a successful termination of pregnancy.

The obstetrician now has a more conservative outlook on placenta previa than formerly. Perhaps it is wise not to consider every case of antepartum vaginal bleeding to be placenta previa. Many a baby has been sacrificed because we were too quick in terminating pregnancy. The patient who reports bleeding, especially before the baby is developed enough for a good chance of survival, should have a careful examination. Several times I recall the bleeding was due to cervical erosion, a ruptured varicose vein, a cervical polyp. There are two valuable diagnostic aids. The x-ray in expert hands can locate the site of placental attachments in 90 per cent of cases. The other is a sterile vaginal examination. To experienced fingers palpatation of the cervix can find the margin of the placenta. The examiner can always find it by inserting a finger inside the cervix, gently sweeping around the whole circumference. Let me stress gentleness.

When a positive diagnosis is made consider these factors: First, if it is placenta previa centralis, abdominal section is indicated. In the primipara with a long cervix, section offers the best chance for the baby. In the multipara, delivery of marginal varieties can be conducted by normal labor. Hospitalize this patient if possible. Check blood pressure and anemia after each bleeding. This woman may be carried along until her baby has a good chance to live. She should be typed for transfusion and blood or donor be in readiness. If hospitalization is not possible have plasma available. Check blood count and hemoglobin after each bleeding spell.

Labor is induced at the selected time by rupture of membrane. The head is an effective tampon. There will be some bleeding as the cervix dilates and fresh sinuses are opened but the head will follow along and close them. More harm often comes from vigorous procedures such as packing, Braxton Hicks versions, bags and delivery through undilated cervix with resulting laceration and hemorrhage.

Premature separation of a normally implanted placenta occurring before labor begins demands hospitalization at once. Abdominal section is the usual procedure. If it occurs during labor, means to control hemorrhage must be prepared. Some type of uterine packer should be at hand in every obstetrical operation. Sterile gauze of large size is easily prepared for use with this instrument.

Hemorrhage is most common after completion of the third stage. Atony frequently follows the long labor, emptying of the overdistended uterus, and the precipitate labor. The early use of "pituitrin" intramuscularly and ergonovine intravenously is good insurance in all cases. The operator must keep the fundus under close observation. An uterine pack should be placed whenever relaxation occurs too often, because much blood may be lost in those frequent little spurts.

Retained portions of placenta may not cause excessive bleeding until the effects of oxytocic drugs wear off. It is necessary that the patient be watched for bleeding at least one hour after completion of the third stage. If hemorrhage does occur and is not controlled by such drugs, the uterus should be explored at once. Digital curettage followed by packing is the treatment.

Lacerations of the cervix cause immediate bleeding. Wide vaginal retraction aids in locating the tear. The lateral lacerations are not dif-

ficult to expose and repair. Those of the posterior cervical lip are more difficult. The following method of exposure has proved helpful. Insert the anterior blade of the vaginal retractor into the dilated cervix and exert pressure on the fundus. The posterior cervix comes nicely into view.

Vaginal lacerations are easily found. In cases of forcep delivery there will occasionally be found a punched out tear over region of the ischial spines. These bleed freely. Repair them all. To insure uniform healing of wounds use a small caliber catgut. Chromic No. 00 or smaller is satisfactory.

Many of us have experienced hematoma formation in vaginal repairs. Most of them are due to a small artery. Undo the repair as soon as found and closure may be redone after hemostasis is accomplished. If this is not done early the wound will break down. Hematomata especially in episotomy wounds produce shock out of proportion to the blood loss. What shall we do with the retained placenta? Authorities vary greatly in the time allowed to lapse before removal. Most physicians have found the method which gives the best results in their hands. We believe that one hour is long enough to wait. If Crede's method does not dislodge it, manual aid is resorted to. Bleeding occasionally must be controlled by packing. After waiting 24 hours or longer the placenta is often not expelled and the incidence of infection at subsequent operation is increased.

Pyelitis is a common complication. A word of warning: repeated attacks of this disease during pregnancy may mean more serious trouble in the urinary tract. Kidney stones often cause this condition.

Bartholin gland abscess may be opened with the actual cautery. The opening will not close nearly so quickly as when an incision is made. Do not remove these glands during the second half of pregnancy. The increased vascularity is too great at this time.

The nutritional deficiencies, anemias, psychoses, emotional changes, various aches and pains of poor posture and support, the vaginal infections and neuritis are mentioned merely in passing.

The last complication to be discussed is the sore breast. Mastitis is usually due to infection entering the gland through a fissure in the nipple. A simple mixture of sulfathiazole and glycerin has given good results. Wash off well before the baby nurses. If fever is present, ice caps are applied, sulfadiazine and alkali are given orally and the baby is not allowed to nurse.

If it is decided early not to let the baby nurse, lactation may be suppressed by the use of stilbestrol.

A PROGRESS NOTE ON MEDICAL EDUCATION IN SOUTH CAROLINA*

By WILLIAM H. KELLEY, M.D.
Charleston, South Carolina

As you may be well aware already, the seat of formal medical education in South Carolina is at the Medical College of the State of South Carolina in Charleston. Although this school and its history are much too well known to justify repetitious description, any account of its progress must necessarily have a point of departure. As a preface for this it is necessary to recall that the college is one of the early American medical schools, having been founded in 1824. A comparatively small school the classes numbered between 40 and 50 until they were temporarily increased to between 50 and 60 during World War II.

A thumbnail sketch of the development might be divided into three periods. The first perhaps covered the period from the founding until 1861 when the school was closed for three years during the War Between the States. Under the proprietary system the school flourished. In this time the faculty were privileged to participate in such notable events as the founding of the American Medical Association and it was among the earliest to adopt bedside teaching in the curriculum. The second period may be said to date from the reopening of the college until the transfer of the ownership and operation to the state in 1913. As with most schools of the

---

*Read in Section on Medical Education and Hospital Training, Southern Medical Association, Thirty-Ninth Annual Meeting, Cincinnati, Ohio, November 12-15, 1945.

defeated states the postwar years brought a continuous struggle for survival. By the end of the century proprietary schools were springing up in profusion. It is a matter of history that this led to the examinations of the Flexner Committee whose report sounded the death knell of the proprietary system. Thus at the end of the second period the school found itself faced with the grim alternatives of closing its doors or of securing a sponsor with the necessary means to take over its operation on an eleemosynary basis.

The current era has of course been the most progressive by far. Through public subscription in which the faculty contributed most generously the school was moved to a new building adjacent to the source of clinical teaching material. With an initial annual appropriation of $10,000 by the State legislature, the college under wise leadership began at once to take on new life. By 1916 the chairs in the preclinical departments had been filled with full time teachers. In the following decade new buildings were constructed to accommodate the departments of physiology and pharmacology and those of pathology and the library. By 1938 full time teachers had been employed in the major clinical divisions. In 1939 it became possible by means of Federal and state appropriations and the contributions of faithful alumni and friends to add two large wings. Incidentally these and certain connections between existing structures were arranged so that when complete the whole will be in the shape of a large quadrangle providing for ready access of each department to the other.

Shortly thereafter a generous donation by the Foundation of the same name made it possible to renovate the old laboratories and to construct the handsome new Baruch Auditorium as an integral part of the quadrangle. As now constituted the Medical College buildings house the preclinical and the clinical laboratories and offices, the library and the Shirras Dispensary which is the out-patient department.

For almost a century the clinical teaching material of the college has been provided through arrangements with the Roper Hospital which is

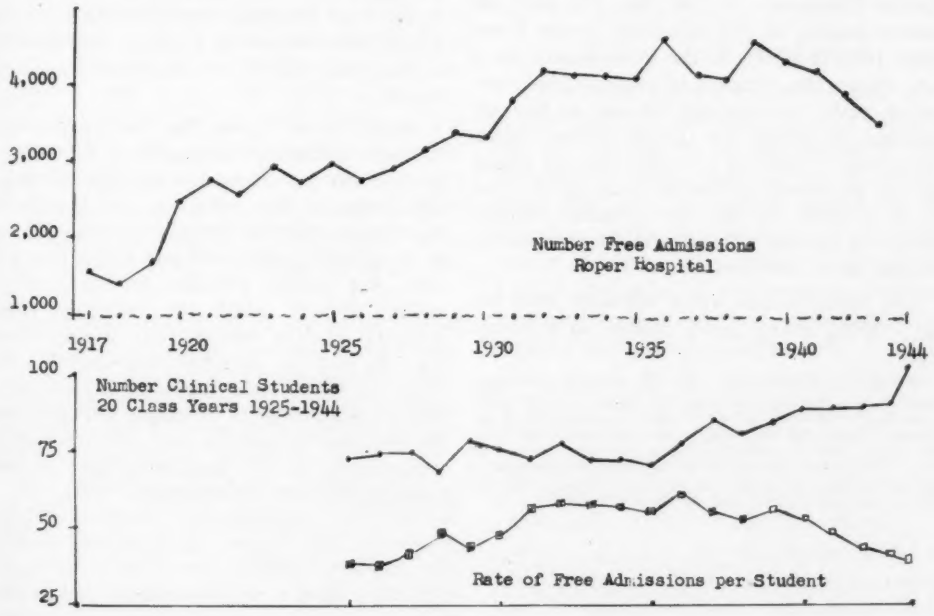


Chart 1

The number of free admissions to Roper Hospital, 1917-1944. The rate of admissions per clinical (third and fourth year) students over a 20-year period.

staffed by the faculty. Needless to state the affiliations between these institutions have been mutually advantageous. The point to be made is that during the recent wartime years the Roper has virtually brought to completion a new 200-bed private pavilion, which will serve to release additional beds for teaching cases.

In point of actual accomplishment I believe this brings this progress note to date. As to present and future problems that the school must meet, opinions of course differ as to their actual and relative importance. The last official survey of the school was made in 1938 and any opinions I may express can carry no authoritative significance.

However, it is agreed, I believe, among the clinical faculty at least that the supply of bedside teaching material stands in need of substantial replenishment.

The clinical material heretofore accredited to the school by the Committee on Medical Education and Hospitals of the American Medical Association has consisted in the main of free admissions to the Roper Hospital and to the Shirras Dispensary. In the *Chart 1* is given the annual number of free admission to the Roper from 1917 to 1944. In the same illustration is also shown the numbers of clinical (third and fourth year) students and the rate of free admissions per annum per clinical student during this period. From this it is clear that the annual rate of in-patient admissions does not measure up to a good average for American medical schools in general. The figures for out-patients are not more favorable.

The reconstruction years following wars are apt to bring unanticipated changes in economy. What those after World War II may afford remains to be seen. All things continuing equal however it seems unlikely that free admission to the teaching service will reach unprecedented numbers in the near future, although they probably will increase over recent years. During the war years the county population increased from approximately 140,000 in 1940 to upward of 200,000 judging from outstanding ration books. The rate of hospitalization of South Carolina in recent years has been almost 9.0 per cent and one-third of average admissions are free. Since the Roper is in operation a county hospital it would appear that should the wartime population even remain, there will still be too few free cases for teaching needs. The argument could be introduced that scarcely any future cases will be free; that through Federal subsidy nearly all cases will be part or full pay, requiring a new standard for the measurement of teaching cases. As yet this remains a matter of conjecture.

Toward the solution of this apparent problem the faculty of the school have proposed to the profession of South Carolina, and through them to the State Planning Board and the Legislature a long term expansion program through which the clinical facilities of the school may be enlarged.

Before such a plan has materialized it is scarcely worthwhile to describe it. However, it provides for no changes in existing affiliations. The program does allow for the construction of a college teaching hospital of about 325 beds to be enlarged as the need and advice may arise. The plan further provides for diagnostic facilities through which the additional clinical teachers required may in part be self-supporting. In fact the plan has been modified from those of other state supported schools whose venture has proved to be largely self-supporting. As yet the proposition has not received the endorsement of the Legislature and no more than progress can be reported.

---

*Author's Note.—Since this paper was presented the General Assembly of South Carolina at the 1946 Session gave the stamp of approval to the plan referred to above for expansion of the Medical College and appropriated the sum of $1,500,000 for the purpose with the conditions that at least an equal sum be secured from proper Federal agencies to match the appropriation and further that the county in which the College is located shall provide the necessary land for the construction,

Southern Medical Journal

JOURNAL OF THE

SOUTHERN MEDICAL ASSOCIATION

Copyright, Southern Medical Association, 1946. Published monthly by the Southern Medical Association, Empire Building, Birmingham 3, Alabama. Annual subscription, $4.00. Single copies 35c each.

Entered as second-class matter at the Post Office at Birmingham, Alabama, under Act of March 3, 1879. Acceptance for mailing at special rate of postage provided for in Section 1103, Act of October 3, 1917, authorized December 20, 1921.

Volume 39 JULY 1946 Number 7

EDITORIAL DEPARTMENT

SOUTHERN MEDICAL ASSOCIATION
Fortieth Annual Meeting
Miami, Florida, November 4-7, 1946

MIAMI, WHERE WE MEET

Committees are rapidly becoming completely organized for the fortieth annual meeting of the Southern Medical Association in Miami, November 4 to 7. The city bids fair to be a happy selection for a scientific group in this particular still weary and strife torn year. A Southern Medical Association Night of the Dade County Medical Association was held early in June in the host city where much enthusiasm was shown for the November meeting (page 596). Plans are being made for a post-convention trip to Cuba following the meeting.

Physicians who have been overworked during the war and since their return to civilian practice deserve and will enjoy an interlude amid restful surroundings. The many excellent papers being prepared for presentation before the section meetings will be stimulating to all.

The past world war has probably seen more medical progress than any other great conflict. This is the first great war in which physicians, medical students and scientific workers were segregated systematically on a large scale in the earliest draft plans. No doubt this has permitted medical and scientific progress to continue as it has never done before in times of great disaster. It is expected that the fruits of the efforts of several past years will be on display amid delightful surroundings in Miami.

OFFICER, DADE COUNTY MEDICAL ASSOCIATION, HOST TO THE SOUTHERN MEDICAL ASSOCIATION

President, Dr. John W. Snyder; *President-Elect*, Dr. Warren W. Quillian; *Vice-President*, Dr. P. J. Manson; *Secretary*, Dr. George C. Austin; *Executive Secretary*, Dr. A. Hampton; *Treasurer*, Dr. James H. Putman; and *Editor of Bulletin*, Dr. Carlos P. Lamar.

CHAIRMEN OF COMMITTEES ON ARRANGEMENTS FOR MIAMI MEETING

General Chairman, Dr. Robert T. Spicer; *Vice General Chairman*, Dr. Warren W. Quillian; *Executive Committee*, Dr. John W. Snyder, Dr. Warren W. Quillian and Dr. Robert T. Spicer; *Finance*, Dr. H. A. Barge; *Clinical Program (Miami Day)*, Dr. S. Marion Salley; *Entertainment*, Dr. Ralph S. Sappenfield; *Hotels*, Dr. L. W. Dowlen; *Meeting Places*, Dr. John D. Milton; *Publicity*, Dr. Homer L. Pearson; *Scientific Exhibits*, Dr. Wiley M. Sams; *Hobby Exhibits*, Dr. Carl E. Dunaway; *Membership*, Dr. Herman Boughton; *Golf*, Dr. Arthur H. Weiland; *Radio*, Dr. M. Jay Flipse; *Women Physicians*, Dr. Iva C. Youmans; and *Ladies Entertainment*, Mrs. W. Carlton Rentz, Jr.

THE WHEAT SHORTAGE

The current critical status of the food supply of the world has once again focused the attention of everyone on the importance of wheat and wheat products. One may well ask why it is wheat that must be especially considered. The answer is simple. Unlike most animal foods of similar nutrient value, wheat is produced in a single crop year. It is a naturally dehydrated food which keeps well and withstands adverse shipping and storage conditions to a considerable degree. It is universally liked among Western peoples. And most important of all, it determines the supply of bread, for which there is no complete substitute. Bread is probably the most economical and the most available of all foods with high nutrient value.

The necessary conservation of wheat and wheat products is being attempted by two programs. The first is the requirement of War Food Order 144 which was effective March 1, 1946. This obligates millers to obtain at least

80 pounds of flour from every 100 pounds of wheat which is milled. (Wheat consists of 85 per cent white endosperm and 15 per cent containing the wheat germ and outer branny coats.) The conventional milling methods of the past sixty years have usually given 72 pounds of flour from every 100 pounds of wheat. Some patent flours have been as low as 58-60 per cent extraction. It was felt, therefore, that by increasing the extraction to 80 per cent, the wheat saving would be 25,000,000 bushels for export, since almost 10 per cent less wheat would be needed to produce the same amount of flour. However, this did not take into consideration the fact that the usual residual 28 per cent which contained the bran, outer coats of grain with adhering white endosperm, and the germ, normally used chiefly for animal feeds would be proportionately decreased. In that case, lacking suitable substitutes, the farmer would be obliged either to market his livestock and poultry or hold more of his grain on the farm. The Department of Agriculture now realizes that only about one-half of the original estimated saving of wheat will be achieved. It therefore becomes apparent that a second program consisting of a campaign for the public actually to consume less wheat products is essential.

The general use of 80 per cent extraction flour instead of the ordinary 72 per cent extraction flour has involved several considerations. Many technical difficulties have been produced for both the miller and the baker. The mill rolls and screen cloths had to be adjusted to give the proper extraction percentage. The baking characteristics of this emergency flour had to be studied and understood. The baking quality of 80 per cent extraction flour is poorer than the usual 72 per cent extraction flour due to the presence of substances from the whole grain which weaken the gluten structure and interfere with fermentation and otherwise cause difficulties in baking. But all these difficulties have been largely overcome.

The undesirability of storing large quantities of flour of any kind in the ordinary household due to the ever present threat of insect infestation of long-stored flour is well known. This longer extraction flour, once infested, is likely to permit more rapid growth and multiplication of weevils and other insect forms than ordinary flour.

Another important consideration is that of the nutrient value of this 80 per cent extraction flour.[1] Bread made with 80 per cent flour would have more of the B vitamins, thiamine, riboflavin, and niacin, than bread made from 72 per cent extraction white flour, but less than that included in enriched white bread. Eighty per cent extraction alone will not accomplish that for which enrichment was designed. In January, 1943, War Food Order 1 became effective requiring that during the present official wartime emergency, white bread be enriched with thiamine, riboflavin, niacin, and iron. This enrichment program was developed as a partial remedy for the loss of such substances in the milling of the wheat. The amounts of thiamine, niacin, and iron in the finished enriched flour are approximately those present in whole wheat. The amount of riboflavin considerably exceeds that contained in whole wheat. Therefore the Council on Foods and Nutrition of the American Medical Association[2] noted with approval and endorsed the decision of the millers and bakers to enrich 80 per cent extraction flour and bread made with such flour. If then the 80 per cent extraction flour is enriched, as is now proposed by the milling and baking industries, in respect to those nutrients it is nutritionally superior to the ordinary flour which it replaces. If this were not done, the result would be a decided reduction of the advantage to the American diet previously achieved through the enrichment of flour of lower extractions and breads made from such flours. Great credit must go to the baking industry for the voluntary enrichment program they have maintained.

The second point in the handling of the acute food shortage, that is, the conservation of wheat products by lowered consumption, remains on a voluntary basis. This is important since some consumers are economically less able to change their eating habits than others. Every person is affected by the order to conserve wheat and wheat products and looks to the

1. Bing, Franklin C.: The Physician's Responsibility in the Present Wheat Shortage. The Interne, 12:329, 1946.
2. Report of Council on Foods and Nutrition. J.A.M.A., 131, 399, 1946.

physician to provide informed opinion on the health aspects of the dietary adjustments that must be made. It is the special responsibility of each and every physician to see that his patients receive an adequate diet with available foods at each income level. The people of the United States are looking to the medical profession and to experts in the field of nutrition to insure the fact that their nutritional well-being is maintained at a high level.

ESTROGENS AND BONE STRUCTURE

It is logical and actually one would now be inclined to say a perfectly obvious fact, that the gonads influence bone structure and shape. Male and female skeletal structure in every species have obvious differences. Modern endocrinology immediately suggests the gonadal hormones as causes of this.

Investigators at the University of Chicago and at Yale[1] have extended the work of many other groups upon bone structure and the physiological changes induced by the estrogens. X-ray diffraction pictures are employed to demonstrate minute physical structure of bone, and the disorientation of it which may take place in as short a time as forty-eight hours after certain treatments, and be restored to normal even after several weeks, if proper therapy is instituted.

Reed, Reed and Gardner[1] studied the x-ray diffraction pattern of rat and mouse tibiae. Their work tends to suggest that other bones, including the teeth, are capable of as rapid change of their solid content as are the tibiae. One is apt to think of an animal's blood or other fluid components as being capable of ready change of composition, and of his bones as being of much more fixed and constant content. The crystal structure of bone, of course, affects its density and strength. Disorientation of bone salts occurs in rickets; and vitamin D therapy is capable of restoring their normal pattern. Both male and female mice showed comparable bone changes, disorientation of crystal structure, upon treatment with estrone pellets. Four pregnant female mice showed no change in bone pattern after estrone pellets, suggesting that the tissues during gestation may have some mechanism for protecting themselves against excess estrogens. Possibly this is concerned with the normal tremendous excretion of estrogen in the urine in pregnancy.

Elsewhere in the JOURNAL comment is made upon the evil of undiscriminating employment of large quantities of estrogenic hormones.[2] Possible immediate effects of injections upon bone or tooth structure are among the hazards to be considered, even in the intensive therapy of the menopause.

1. Reed, E. L.; Reed, B. P.; and Gardner, W. E.: The Influence of Estrogens on the Crystal Structure of Bone as Revealed by X-ray Diffraction Studies on the Femora of Mice. Endocrinology, **38**:238, 1946.

2. Weaver, John D.: Estrogenic Hormones, Often Only a Psychotherapeutic Agent. Sou. Med. Jour., this issue p. 581.

TWENTY-FIVE YEARS AGO

FROM JOURNALS OF 1921

Famine in China, Third Year Post-War.[1]—The five provinces or states which are principally affected by famine are Chihli, Shansi, Shensi, Honan and Shantung, which roughly speaking, represent the northeast quarter of China proper. The famine is the result of a severe drought lasting without relief through the spring and summer of 1920. The severest famine has been in those regions along the Yellow River, which flows first south and then east through this territory. Three years ago it broke its bounds and by flooding the land brought destruction and disaster all along its course. In these regions, therefore, there was no reserve supply of grain. Famine was predicted early last summer. . . The first effect was emigration of the people from the famine districts. The inhabitants went first by hundreds and then by thousands. . . . Here and there organizations were formed which attempted to give local relief . . . profiteering and graft (among them) were not unknown. . . . In September the International Famine Relief Committee was formed. . . . Accurate surveys had to be made. It was at first estimated that twenty million people were threatened with starvation. . . . This would involve the enormous sum of a hundred million dollars. The Committee was at once faced with the impossibility of raising such a fund. . . . The question, "Whom shall we save and whom let die?" had to be answered. . . Two policies were suggested: first to select the best elements . . . ; second, to help only the absolutely destitute . . . the latter policy prevailed . . . there were found to be ten million who would surely die if help was not given them. Even this number could not all be saved. . . . Drawing lots has always appealed to the Chinese. There is something supernatural about it, something of fate . . . Those who are

1. Foreign Letter, Peking. Famine in China. J.A.M.A. 77:55, 1921.

lucky are given a grain ticket which is good for twenty pounds of grain a month until harvest time. . . . Those who have a little grain mix it with all sorts of vegetables and mineral diluents to give bulk, to satisfy the craving of hunger. Grass, dried leaves, tree bark, corn cobs, thistle leaves, chaff, locust berries, ground up soap stone and white clay have all been found in the famine food.

Hot Springs Meeting.[2]—No city of its size in the country has a more progressive medical profession than Hot Springs National Park, Arkansas * * * Mr. C. P. Loranz, Business Manager of the Southern Medical Association * * * is most enthusiastic over the hotels of Hot Springs * * * The Hot Springs physicians already have tentative plans for the convention of the Southern Medical Association * * * Among the suggestions are a series of clinics in the large Government Hospital. It is probable that there will be clinics on the tecnics of spinal puncture in the diagnosis and treatment of neurological syphilis; on malaria, the chronic arthritides and orthopedic surgery.

2. Editorial. Hot Springs Meeting. Sou. Med. Jour., **14**:515 (June) 1921.

Book Reviews

An Introduction to Essential Hypertension. By Richard F. Herndon. 88 pages. Springfield, Illinois: Charles C. Thomas, Publisher, 1946. Price $2.50.

The author makes no pretense of attempting a thorough, detailed investigation of this perplexing clinical problem. The eight chapters of this brief monograph consist of discussions of normal blood pressure, the etiology and mechanism involved, physiology, pathology, clinical aspects, prognosis, diagnosis, and treatment. The theoretical concepts and pathological changes are handled adequately. There are four colored plates of retinal lesions and several photomicrographs of vascular pathology. Diagnosis is perhaps not given the space it deserves. There is entirely too great an assumption that everyone understands just how to determine blood pressure: the inadequacy of the usual routine examination of the cardiovascular system is not mentioned. There should be some warning against treating individuals with labile pressure or transient elevations as hypertensives. The chapter on treatment is excellent. It fulfills all that the author desires. The volume will be of value for medical students and general practitioners.

New Drugs. By Arthur D. Herrick, with a foreword by Dr. Austin E. Smith. 303 pages. New York: Revere Publishing Company, 1946. Price $4.00.

This book contains authoritative information concerning the Federal Food, Drug, and Cosmetic Act, especially in regard to new drug legislation. Criteria are given for determining the legal status of new drugs; directions are given as to the procedure for filing an application for marketing the product. The appendix contains the report of the Secretary of Agriculture on deaths due to elixir sulfanilamide, the complete Federal Food, Drug and Cosmetic Act, sections from certain state and city new drug legislation, and the Official Rules of the Council on Pharmacy and Chemistry of the American Medical Association.

There has long been a need for such a collection of information in one volume as this book supplies. It should prove invaluable to all who are concerned with the investigation, manufacture, and distribution of new drugs. It will be of interest to the physician who wishes to know what goes on "behind the scenes" before a new drug is available to him.

A Malariologist in Many Lands. By Marshall A. Barber. With a foreword by Paul F. Russell. 156 pages. Lawrence, Kansas: University of Kansas Press, 1946. Price $2.50.

This is a pleasant, non-technical, and humorous account of the experiences of an internationally prominent malariologist. The global importance of malaria, sharply focussed on medical consciousness by World War II, makes this book of timely interest.

Dr. Barber's travels included practically every malarial district in the world. Aware of more than the medical aspects of his journeys, he zestfully imparts his hearty delight in new lands and new people. He aptly shows the relationship of malaria to such environmental agencies as floods, famine, irrigation, and wild animals; and to poverty, ignorance, and superstition.

More than plasmodia and more than anopheles, more even than travelling, one is impressed by the personality of a friendly intelligence and a humorist. The book will be enjoyed equally by laity and physicians.

The Marihuana Problem in the City of New York: Sociological, Medical, Psychological and Pharmacological Studies. By the Mayor's Committee on Marihuana. 220 pages. Lancaster, Pennsylvania: The Jaques Cattell Press, 1945. Cloth $2.50.

This publication by a group of specialists covers all phases of the problem, including a good review of the literature, reports by social service workers and city detectives, psychological studies by Drs. Morrow, Halpern and Woltmann, extensive experiments of the effect on man; on the pharmacology by Drs. Loewe and Modell, on the medical aspects and clinical pathology by Dr. Allentuck, on the sociological aspects by Dr. Shoenfeld. There is a good summary by Dr. George Wallace, Chairman of the eminent committee from the New York Academy of Medicine, which supervised the work. The surprising thing to the reviewer was that the drug seems to be milder than is commonly supposed, that its cessation does not result in mental and physical distress comparable to that of morphine addiction, and that aggressiveness, belligerency, and eroticism are not commonly seen among users, contrary to most crime fiction stories published currently.

Bahia Honda Bridge on the Overseas Highway between Miami and Key West is an example of magnificent construction and of the difficulties which were surmounted before the highway's opening.

Miami—Where We Meet

MIAMI IN NOVEMBER*

The climate of Miami, lovely for twelve months in the year, is the first thing that takes firm hold of the memory. The blue waters and golden sands are another attraction. And the many outside diversions, both natural and commercial, will be speedily discovered by the Southern Medical Association during its November meeting.

Two mainland beaches offer every facility for swimming, sun bathing, surfcasting and boating. At Matheson Beach, run under county auspices, there is adjoining Matheson Hammock with full picnic facilities, and jungle paths for those who care to hike. Nearby Tahiti Beach offers swimming and sun bathing under South Sea Island conditions with swaying coconut palms and thatched huts to lend reality to the illusion.

There are miles of sun-swept beaches across any of the three causeways which link Miami with the Atlantic Ocean. Here swimming from oceanside cabanas is available almost every day in the year, and cabana facilities are always arranged for conventions for both men and women.

There's pleasure by boat as well. Those who like to have a hand on the tiller may rent boats, inboard, outboard or even rowboats, and those who prefer to relax more thoroughly may venture on one of the many sightseeing trips in the area. This is not only one of the most pleasant ways of seeing the shores of Miami and Miami Beach, but provides two or three hours of delightful cruising over surrounding waters. There are trips down the shoreline south of Miami, past Millionaires' Row, where are some of the oldest and most magnificent of Miami waterfront estates, through the Florida Keys, up the Miami River to Musa Isle where Seminole Indians dwell within the city's limits, or over the waters of Biscayne Bay and between the islands of Miami and Miami Beach, pumped up by man from the Bay bottom. Physicians who want to take advantage of the Miami moon will probably choose a moonlight ride over shimmering waters, a never-to-be-forgotten adventure. Others with a natural-history bent will choose one of the glass-bottomed boats built especially so that they may see the beauties of the ocean bed and still keep their feet dry.

There are not merely aquatic attractions around Miami, even though one-third of the area is water. There are beautiful automobile drives around the environs, out to Greynolds Park, one of the most delightful of picnic spots with fresh and salt water lagoons, kyaks for hire, riding trails and all the "works" for barbecues. A motorcade is usually arranged for the pleasure of convention visitors and this also includes a visit to Hialeah, loveliest of racetracks, with its hundreds of rosy flamingoes who nest permanently on the infield islands, the exquisite flowers and tropical shrubs, and also to Coral Gables, home of the University of Miami. This college, product of Miami's real-estate boom in the 1920's, began in a hotel building with a $500,000 debt and is today rated as one of the distinguished institutions of learning in the South with an enrollment of 3,450 students and more than 500 courses to choose from.

A post-convention trip physicians may plan for themselves is down the Overseas Highway to Key West. This highway, successor to Henry M. Flagler's Florida East Coast Railroad extension, is still one of the engineering marvels of the age. Continuation of U. S. Route 1, which runs from Maine to Miami, it is truly a road which "goes to sea" and on the way to Key West spans gaps between the Key which necessitate bridges as much as seven miles in length. Just one thrill after another on this one hundred and fifty-seven-mile scenic highway. Moreover, it is probable that by the time the Southern Medical Association comes to town, the Key West-Havana Ferry may be in operation. This will enable an automobile and four passengers to

*Prepared for the SOUTHERN MEDICAL JOURNAL by the News Bureau of the City of Miami, Mr. Benton E. Jacobs, Manager.

reach Cuba by the "Carib Queen," a luxuriously-converted LSD, for the modest sum of $20 for the one-way trip. It will certainly provide a golden and unexpected opportunity for many people to take a trip abroad.

Naturally, those who wish to reach Cuba, or the West Indies by speedier means, will make the trip by air. "Every hour on the hour," is Pan American World Airways' slogan and there are other lines which also make these trips at frequent intervals and at moderate rates.

Miami is not only a jumping-off ground for boats and planes, however. For the sporting-minded, there are the horse races. With about 120 days of racing a year, each of the three tracks in the area has about 40 days' racing and the bangtails race to "full houses" pretty well every day during the season at either Gulfstream, Hialeah or Tropical. The same applies at the four dog tracks, Broward, Miami Beach, West Flagler and Biscayne Kennel Clubs, where greyhounds chase the mechanical rabbit from November until the end of May. There is legalized pari-mutuel betting at all of these plants, and also at the Biscayne Fronton where from Christmas until April may be witnessed the only Jai Alai (Hi-Li) to be seen in the United States.

Those who prefer to spend their time with flora and fauna will find their needs equally well satisfied. There is the Fairchild Tropical Garden, one of the world's great exhibits of tropical trees, flowers and shrubs, collected from all over the globe by the eminent scientist, Dr. David Fairchild. Close by there is the Parrot Jungle, an unusual commercial exhibit in that vivid-colored macaws fly free through the trees and obligingly come to rest on visitors' shoulders. The Sausage Tree with its strange fruit resembling live "hot dogs" grows close at hand.

The Rare Bird Farm is another "jungle" where birds of every size and from every land are to be seen and enjoyed. The Monkey Jungle, 22 miles south of Miami, is a particular novelty of the area. Here human visitors are caged and the monkeys go free through trees resembling their natural jungle habitat. The Orchid Jungle farther south still and on the very edge of the Florida Everglades, is being developed as a beauty spot for native and imported orchids to bloom in natural surroundings.

As to zoos, there is the North Miami Zoological Gardens with between two and three thousand birds, animals and reptiles and also a world-famed trained tiger act. Tropical Hobbyland is another zoological exhibit with birds, monkeys and other animals on view.

For those who wish to see Florida game close at hand there are trips through the Everglades, and during the hunting season excursions into the stamping grounds of duck, dove, quail and wild turkey as well as into the haunts of the Seminoles, an Indian tribe which has yet to smoke the pipe of peace with Uncle Sam.

With 39 movie houses and nightclubs galore to fill in the gaps, convention visitors should have a grand and glorious time in the hours before and after scientific sessions.

Southern Medical News

SOUTHERN MEDICAL ASSOCIATION NIGHT IN MIAMI

The regular meeting of the Dade County Medical Society, Miami, Florida, on Tuesday evening, June 4, at the Municipal Auditorium in Bay Front Park on Biscayne Boulevard, was "Southern Medical Association Night." The meeting was called to order by the President of the society, Dr. John W. Snyder, who presided during the thirty-minute business period. Dr. S. W. Page of the Program Committee presided during the program period.

Dr. E. L. Henderson, President-Elect, Southern Medical Association, Louisville, Kentucky, spoke briefly on "The Miami Meeting in November."

Dr. M. Y. Dabney, President, Southern Medical Association, Birmingham, Alabama, read a paper entitled "Some Effects of Wars Upon Medicine."

Dr. Irvin Abell, Past President and Chairman of Board of Trustees, Southern Medical Association, Louisville, Kentucky, read a paper entitled "Diverticulosis and Diverticulitis" (Lantern Slides).

Mr. C. P. Loranz, Secretary and General Manager, Southern Medical Association, Birmingham, Alabama, was introduced by Dr. Snyder and spoke briefly.

Following the regular meeting the Southern Medical Association was host to a social hour with refreshments.

ALABAMA

Dr. Sidney J. Williams, Livingston, succeeds Dr. Robert D. Spratt, Livingston, as Health Officer of Sumter and Greene Counties.

Dr. James Hammond Walker, Birmingham, and Miss Martha Jane Greaves, Philadelphia, Pennsylvania, were married recently.

Dr. Don E. King, Birmingham, and Miss Janice Root Mack, Athens, Pennsylvania, were married recently.

Deaths

Dr. Hamilton Ralls Coston, Birmingham, aged 79, died recently of coronary thrombosis.

Dr. Jesse H. Martin, Selma, aged 64, died recently.

ARKANSAS

Arkansas Medical Society at its recent annual meeting installed Dr. H. King Wade, Hot Springs, President; and elected Dr. L. T. Evans, Batesville, President-Elect; Dr. J. Harry Hayes, Little Rock, First Vice-President; Dr. W. G. Eberle, Fort Smith, Second Vice-President; Dr. H. A. Stroud, Jonesboro, Third Vice-President; Dr. Paul L. Mahoney, Little Rock, Treasurer; and Dr. W. R. Brooksher, Fort Smith, Secretary, reelected. The 1947 meeting will be held in April.

Carroll County Medical Society has elected Dr. D. K. McCurry, Green Forest, President; Dr. A. L. Carter, Berryville, Vice-President; and Dr. D. C. Roberts, Berryville, Secretary-Treasurer.

Crittenden County Medical Society has elected Dr. A. C. Parker, Sr., Clarkedale, President; Dr. Ralph Hamilton, West Memphis, Vice-President; and Dr. Robert H. Ray, Earle, Secretary-Treasurer.

Boone County Medical Society has elected Dr. Ulys Jackson, Harrison, President; Dr. D. M. G. Frailey, Mount Judea, Vice-President; and Dr. Ross Fowler, Harrison, Secretary-Treasurer.

Dallas County Medical Society has elected Dr. H. A. Cheatham, Princeton, President; Dr. E. E. Estes, Fordyce, Vice-President; and Dr. J. E. M. Taylor, Sparkman, Secretary-Treasurer.

Phillips County Medical Society has elected Dr. W. B. Connoly, Helena, President; Dr. Aris W. Cox, Helena, Vice-President; and Dr. John B. Terry, Secretary-Treasurer.

Woodruff County Medical Society has elected Dr. J. W. Morris, McCrory, President; Dr. F. C. Maguire, Augusta, Vice-President; and Dr. C. E. Dungan, Augusta, Secretary-Treasurer.

Clay County Medical Society has elected Dr. N. J. Latimer, Corning, President; Dr. O. H. Clopton, Rector, Vice-President; and Dr. J. E. McGuire, Piggott, Secretary-Treasurer.

Continued on page 56

CHILDREN MUST GROW

GRODHR

There is a word for growth in every language... The English word comes from the Icelandic Grodhr.

Vitamins A and the whole of B supply, each, their independent, needed growth factors.

The pioneers used Dried Brewers Yeast in finding and showing the independent Vitamin B growth need for both animals and children.

Hess, Bloxson and others used it to aid in the growth of incubator babies; found it easily borne.

At approximately four to five grams to a teaspoon, one-quarter for bottle formulas, one-half to one for older children, are indicated.

Add to milk, cereals, soups, vegetables.

Vitamin Food Company's Red Label (Debittered), Green Label (Undebittered, mostly used in pellagra) or Autolex (enzyme digested), brands of Dried Brewers Yeast supply the needed whole of Natural Vitamin B in pure and potent form.

THE VITAMIN FOOD COMPANY, INCORPORATED
VFC
NEWARK, N.J. U.S.A.

Samples sent to physicians and hospitals

VITAMIN FOOD COMPANY, INC.

Vitamin Research Laboratories, Inc.

187 Sylvan Avenue **Newark 4, N. J.**

Continued from page 596

Clark County Medical Society has elected Dr. C. K. Townsend, President; and Dr. Joe W. Reid, Secretary-Treasurer, both of Arkadelphia.

Columbia County Medical Society has elected Dr. Joe F. Rushton, Magnolia, President; Dr. T. H. Jones, Waldo, Vice-President; and Dr. John H. Wilson, Magnolia, Secretary-Treasurer.

Jefferson County Medical Society has elected Dr. Allen Russell, President; Dr. H. T. Capel, Vice-President; and Dr. B. D. Luck Jr., Secretary-Treasurer, all of Pine Bluff.

Jackson County Medical Society has elected Dr. J. F. Jackson, Walnut Ridge, President; Dr. I. H. Erwin, Newport, Vice-President; and Dr. J. B. Ivy, Tuckerman, Secretary-Treasurer.

Lincoln County Medical Society has elected Dr. Chas. W. Dixon, Gould, President; Dr. B. L. Bailey, Star City, Vice-President; and Dr. Buford M. Gardner, Star City, Secretary-Treasurer.

Monroe County Medical Society has elected Dr. M. L. Dalton, Brinkley, President; Dr. W. H. Martin, Holly Grove, Vice-President; and Dr. W. L. Boswell, Clarendon, Secretary-Treasurer.

Montgomery County Medical Society has elected Dr. J. H. McLean, Caddo Gap, President; and Dr. G. E. Watkins, Mount Ida, Secretary-Treasurer.

Saint Francis County Medical Society has elected Dr. J. S. Davidson, Forrest City, President; Dr. J. M. Roy, Vice-President; and Dr. J. O. Rush, Forrest City, Secretary-Treasurer.

Dr. W. R. Parsons, Little Rock, has been appointed part-time Pediatric Clinician with the Little Rock City Health Department.

Dr. W. J. B. Williams, Cotton Plant, has been appointed part-time Pediatric Clinician with the Woodruff County Health Department.

Dr. Euclid M. Smith, Hot Springs National Park, was elected Second Vice-President of the American Therapeutic Society at its meeting held recently in Atlantic City.

Deaths

Dr. John Cullen Beard, Pine Bluff, aged 50, died May 7.

DISTRICT OF COLUMBIA

District of Columbia Physician-Veterans of World War II is a new organization founded March 25 at a meeting of physician-veterans in Washington. Officers elected are: Dr. W. Warren Sager, President; Dr. Aloysius J. Connolly, Vice-President; Dr. Stafford W. Hawken, Secretary-Treasurer; and members of Executive Committee: Dr. John H. Lyons, Dr. J. Lawn Thompson Jr., Dr. Robert J. Coffey and Dr. James N. Greear Jr., all of Washington.

Dr. Courtney M. Smith, Washington, succeeds Dr. G. Foard McGinnes as Medical Director for the American Red Cross.

Dr. Sidney Berman, Washington, has been appointed Director, Washington Institute of Mental Hygiene, replacing Dr. Rex E. Buxton, who resigned to enter private practice.

Dr. Raymond T. Holden, Washington, recently discharged from the Navy, has been elected President of the Medical Society of the District of Columbia for 1947.

Dr. Wallace H. Graham, Colonel, Medical Corps, U. S. Army, personal physician to President Truman, has received the French Chevalier of the Legion of Honor and the Croix de Guerre for services in Normandy. He was cited for personally caring for wounded French soldiers.

Dr. Brian Blades, Lieutenant Colonel, Medical Corps, U. S. Army, Chief of the Thoracic Surgery Section, Walter Reed General Hospital, succeeds Dr. Charles Stanley White as Professor of Surgery, George Washington University School of Medicine. Dr. White recently retired after having served on the faculty forty-five years.

Deaths

Dr. F. Homer Curtiss, Washington, aged 70, died recently of cerebral hemorrhage and coronary occlusion.

Dr. Clarence Warren Mehlhop, Washington, aged 73, died recently.

Dr. James Lloyd Collins, Washington, aged 44, died recently.

FLORIDA

Dr. E. Sterling Nichol, Miami, was elected President of the Florida Section of the American College of Physicians at the recent meeting in Jacksonville.

Florida Association of Industrial Surgeons and the Florida Association of Railway Surgeons recently voted to combine their groups under the new name, the Florida Association of Industrial and Railway Surgeons. New officers elected are Dr. F. A. Vogt, Miami, President; Dr. J. H. Mitchell, Jacksonville, Secretary-Treasurer; and Dr. W. H. Chapman and Dr. F. L. Fort, both of Jacksonville, Directors.

Florida Health Officers Society re-elected Dr. Frank V. Chappell, Tampa, President; and Dr. L. L. Parks, Jacksonville, Secretary-Treasurer.

Florida Society of Ophthalmology and Otolaryngology has elected Dr. Walter Hotchkiss, Miami, President; and Dr. Jerome Knauer, Jacksonville, Vice-President.

Florida Pediatric Society has elected Dr. Council Rudolph, St. Petersburg, President.

Florida Dermatological Association at its recent meeting held in Jacksonville elected Dr. Sam F. Ricker, Orlando, President; and re-elected Dr. Wesley W. Wilson, Tampa, Secretary.

Dr. Albert V. Hardy, Washington, D. C., has been appointed Director of the Bureau of Laboratories of the Florida State Board of Health. Dr. Hardy has been serving with the Office of Scientific Research and Development and the National Institute of Health.

Dr. Aubrey Y. Covington, has been appointed Director, Bradford-Clay-Union County Health Unit with headquarters at Starke.

Dr. C. H. Sharp, recently released from the United States Public Health Service, has been appointed Director, Bureau of Tuberculosis Control of the State Board of Health.

Dr. Thomas G. Faison, recently released from the Army, has been appointed Director, Bay County Health Department with headquarters at Panama City.

Dr. Ava Lancaster Cannon, formerly of Haines City, has opened her office for practice in Orlando.

Dr. Harrison G. Palmer and Mrs. Marion B. Jones, both of St. Petersburg, were married recently.

Dr. Marion C. Martin, Miami, and Mrs. Elizabeth P. Clinton, Chattanooga, Tennessee, were married recently.

Deaths

Dr. E. H. Adkins, Miami Beach, aged 64, died recently.

Dr. J. M. Biedler, Fort Lauderdale, aged 73, died recently.

Dr. Wesley Jackson Breeding, Lakeland, aged 76, died recently of coronary thrombosis and generalized arteriosclerosis.

Dr. Walter Harmon Dyer, Tampa, aged 57, died recently of coronary thrombosis.

Dr. M. A. Kugel, Miami Beach, aged 47, died recently.

Dr. Charles A. Lauffer, St. Petersburg, aged 70, died recently of abdominal carcinoma.

Continued on page 58

Alcoholism
Senility
Drug Addiction

A Modern Ethical Sanitarium at Louisville
Established 1904

Mental
and
Nervous Diseases

BEAUTIFUL AND SPACIOUS GROUNDS AFFORD OUTDOOR RELAXATION

Our **ALCOHOLIC** treatment destroys the craving, restores the appetite and sleep, and rebuilds the physical and nervous condition of the patient. Liquors withdrawn gradually; no limit on the amount necessary to prevent or relieve delirium.

MENTAL patients have every comfort that their home affords.

The **DRUG** treatment is one of gradual Reduction; it relieves the constipation, restores the appetite and sleep; withdrawal pains are absent. No Hyoscine or rapid withdrawal methods used unless patient desires same.

NERVOUS patients are accepted by us for observation and diagnosis, as well as treatment.

Select cases of SENILITY accepted. Physiotherapy—Clinical Laboratory—X-Ray. Consulting Physicians.

Rates and Folder on request

THE STOKES SANITARIUM

Telephones
Highland 2101
Highland 2102

E. W. STOKES, M.D., Medical Director, 923 Cherokee Road, Louisville, Kentucky

HOW TO PLAN

Reducing Diets

EASY FOR PATIENTS TO STICK TO!

No matter how sound the diet, if a patient won't follow it, it won't work.

But you *can* plan reducing diets acceptable both to you and the patient. You'll find Knox Gelatine a big help here.

Knox Gelatine is all protein, no sugar.

Knox salads and desserts add variety and interest to restricted diets. Many contain high residue, low-calorie foods and so help stave off hunger.

Drinking Knox in water or dilute fruit juices between meals is another good, low-calorie way to combat hunger and make dieting easier.

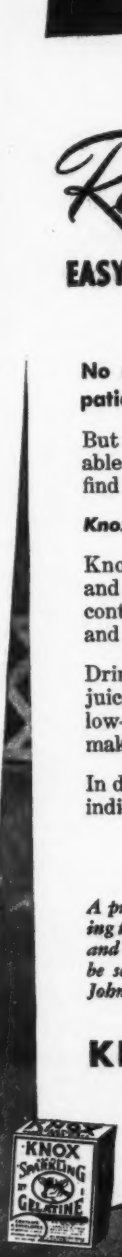
In diets where supplementary protein is indicated, Knox is of special value.

FREE Diets and Recipes

A practical and authoritative booklet containing tables of food values, diet list, sample menu, and delicious, low-calorie gelatine recipes will be sent FREE *upon request to Knox Gelatine, Johnstown, N. Y.*

KNOX GELATINE (U.S.P.)

PLAIN, UNFLAVORED GELATINE...
ALL PROTEIN, NO SUGAR



CONTEMPORARY

CRIMINAL HYGIENE

A sourcebook on the Nation's No. 1 social problem. For workers in the fields of public welfare and for the laity.

Edited by

A Psychiatrist - - - - Robert V. Seliger

A Lawyer - - - - - - - Edwin J. Lukas

A Criminologist - - - Robert M. Lindner

CONTRIBUTORS: Ralph S. Banay, Ralph Brancale, Hervey Cleckley, Victoria Cranford, Robert M. Lindner, Harry R. Lipton, Edwin J. Lukas, Sophia M. Robison, William S. Sadler, Robert V. Seliger, Negley K. Teeters, Lawrence F. Woolley.

OAKRIDGE PRESS

2030 Park Avenue, Baltimore 17, Md.

Please send Contemporary Criminal Hygiene

☐ copies cloth bound with index $4.00

Name.....

Address.....

.....

Continued from page 56

Dr. George Henry Noble, St. Augustine, aged 55, died recently of coronary thrombosis.

Dr. James Rex Scholl, St. Petersburg, aged 65, died recently of carcinoma of the cecum.

Dr. Peter T. Skaggs, Miami, aged 77, died April 2.

GEORGIA

Medical Association of Georgia at its ninety-sixth annual meeting held in Macon recently installed Dr. Ralph H. Chaney, Augusta, President; and elected Dr. Steve P. Kenyon, Dawson, President-Elect; Dr. A. M. Phillips, Macon, First Vice-President; Dr. C. Purcell Roberts, Atlanta, Second Vice-President; Dr. John W. Simmons, Brunswick, Parliamentarian, re-elected; and Dr. Edgar D. Shanks, Atlanta, Secretary-Treasurer, re-elected. Augusta was selected as the meeting place for 1947.

Jefferson County Medical Society has elected Dr. J. J. Pilcher, Wrens, President; Dr. C. Roy Williams, Wadley, Vice-President; and Dr. J. W. Pilcher, Louisville, Secretary-Treasurer.

Lamar County Medical Society has elected Dr. D. W. Pritchett, President; Dr. J. H. Jackson, Vice-President; and Dr. S. B. Traylor, Secretary-Treasurer, all of Barnesville.

Laurens County Medical Society has elected Dr. J. A. Bell Jr., President; Dr. Fred J. Coleman, Vice-President; and Dr. O. H. Cheek, Secretary-Treasurer, all of Dublin.

Monroe County Medical Society has elected Dr. W. J. Smith, President; and Dr. G. H. Alexander, Secretary-Treasurer, both of Forsyth.

Newton County Medical Society has elected Dr. W. D. Travis, Covington, President; and Dr. J. B. Mitchell Jr., Porterdale, Secretary-Treasurer.

Polk County Medical Society has elected Dr. John M. McGehee, President; Dr. Raymond F. Spanjer, Vice-President; and Dr. Cecil B. Elliott, Secretary-Treasurer, all of Cedartown.

Randolph-Terrell Counties Medical Society has elected Dr. Robert B. Martin, III, Cuthbert, President; Dr. Charles R. Smith, Dawson, Vice-President; and Dr. W. G. Elliott, Cuthbert, Secretary-Treasurer.

Rockdale County Medical Society has elected Dr. H. E. Grigg, Conyers, Secretary-Treasurer.

Spalding County Medical Society has elected Dr. Thomas J. Floyd Jr., President; Dr. T. G. Smaha, Vice-President; and Dr. T. O. Vinson, Secretary-Treasurer, all of Griffin.

Sumter County Medical Society has elected Dr. A. C. Primrose, Americus, President; Dr. J. C. Logan, Plains, Vice-President; and Dr. R. H. Enzor, Smithville, Secretary-Treasurer.

Tattnall County Medical Society has elected Dr. J. C. Collins, Collins, President; Dr. L. R. Jelks, Reidsville, Vice-President; and Dr. J. M. Hughes, Glennville, Secretary-Treasurer.

Telfair County Medical Society has elected Dr. W. H. Born, President; Dr. C. J. Maloy, Vice-President; and Dr. F. R. Mann, Secretary-Treasurer, all of McRae.

Thomas County Medical Society has elected Dr. George R. Dillinger, President; Dr. John Mobley, Vice-President; and Dr. Mary J. Erickson, Secretary-Treasurer, all of Thomasville.

Tift County Medical Society has elected Dr. Carlton A. Fleming, President; Dr. Charles E. Zimmerman, Vice-President; and Dr. C. S. Pittman, Secretary-Treasurer, all of Tifton.

Tri-County (Calhoun-Early-Miller) Medical Society has elected Dr. S. P. Holland, Blakely, President; Dr. C. K. Sharp, Arlington, Vice-President; and Dr. J. G. Standifer, Blakely, Secretary-Treasurer.

Tri-County (Liberty-Long-McIntosh) Medical Society has elected Dr. O. D. Middleton, Ludowici, Secretary-Treasurer.

Turner County Medical Society has elected Dr. W. J. Turner, President; and Dr. J. H. Baxter, Secretary-Treasurer, both of Ashburn.

Walton County Medical Society has elected Dr. Charles S. Floyd, Loganville, President; Dr. Phillip R. Stewart, Monroe, Vice-President; and Dr. Lynn M. Huie, Monroe, Secretary-Treasurer.

Warren County Medical Society has elected Dr. H. B. Cason, President; Dr. F. L. Ware, Vice-President; and Dr. A. W. Davis, Secretary-Treasurer, all of Warrenton.

Washington County Medical Society has elected Dr. O. D. Lennard, President; Dr. N. J. Newsom, Vice-President; and Dr. Willima Rawlings, Secretary-Treasurer, all of Sandersville.

Wayne County Medical Society has elected Dr. Thomas G. Ritch, Jesup, President; Dr. J. Lawton Tyre, Screven, Vice-President; and Dr. James W. Yeomans, Jesup, Secretary-Treasurer.

Whitfield County Medical Society has elected Dr. Fred B. Ragland, President; Dr. D. L. Wood, Vice-President; and Dr. H. J. Ault, Secretary-Treasurer, all of Dalton.

Wilkes County Medical Society has elected Dr. T. C. Nash, Pilomath, President; Dr. C. E. Wills, Washington, Vice-Pres/

Continued on page 60

BECAUSE Sam Jones' tuberculosis was discovered in its incipient stage, as the result of a periodic chest x-ray examination, it was possible to take proper steps in time to protect others in the Jones family. In addition, the treatment prescribed for Jones permitted him to keep on working . . . prevented the hardship of hospitalization and loss of income.

Nearly every community has radiological services available to its physicians. And Kodak manufactures high-quality x-ray film, chemicals, and intensifying screens for the profession . . . capable of giving the maximum detail and adequate contrast so necessary for easy, sure interpretation.

EASTMAN KODAK COMPANY
Medical Division
ROCHESTER 4, N. Y.

Kodak

Continued from page 58

dent; and Dr. R. G. Stephens, Washington, Secretary-Treasurer.

Upson County Medical Society has elected Dr. T. A. Sappington, President; Dr. James A. Woodall, Vice-President; and Dr. John D. Blackburn, Secretary-Treasurer, all of Thomaston.

Bartow County Medical Society has elected Dr. Hugh S. McGowan, President; and Dr. A. L. Horton, Secretary-Treasurer, both of Cartersville.

Cherokee-Pickens Medical Society has elected Dr. J. T. Pettit, Canton, President; Dr. E. A. Roper, Jasper, Vice-President; and Dr. R. T. Jones, III, Canton, Secretary-Treasurer.

Greene County Medical Society has elected Dr. Goodwin Gheesling, Greensboro, President; Dr. W. H. Lewis, Siloam, Vice-President; and Dr. Franklin H. Killam, Greensboro, Secretary-Treasurer.

Taylor County Medical Society has elected Dr. F. H. Sams, Reynolds, President; Dr. S. H. Bryan, Reynolds, Vice-President; and Dr. R. C. Montgomery, Butler, Secretary-Treasurer.

Ninth District Medical Society has elected Dr. Edward W. Grove, Gainesville, President; Dr. H. H. Lancaster, New Holland, Vice-President; and Dr. Pratt Cheek, Gainesville, Secretary-Treasurer, re elected.

Seventh District Medical Society has elected Dr. F. H. Simonton, Chickamauga, President; Dr. D. Lloyd Wood, Dalton, President-Elect; and Dr. Inman Smith, Rome, Secretary.

Eighth District Medical Society has elected Dr. J. A. Leaphart, Jesup, President; Dr. W. W. Turner, Nashville, Vice-President; and Dr. G. T. Crozier, Valdosta, Secretary.

Dr. Norton Frierson, Atlanta, announces his association with Dr. Leo P. Daly, Medical Arts Building, Atlanta.

Dr. M. M. Harris, Waycross, has been appointed Chief of the Clinical Laboratories, Macon Hospital.

Dr. Sage Harper, formerly of Ambrose and Wray, announces the opening of his office for the practice of medicine at Douglas.

Dr. J. B. Martin, formerly of Shellman, is now associated with Dr. J. S. Beard, Beard Clinic, Edison.

Dr. C. L. Ridley, Macon, has been elected President, Central Georgia Hospital Service.

Dr. James Jernigan Crumbley Jr., Sylvester, and Miss Barbara Clarke Covington, Dade City, were married recently.

Deaths

Dr. James Carlton Holliday, Athens, aged 60, died recently.

Dr. Jesse Weathers Humber, Lumpkin, aged 55, died recently of acute nephritis.

Dr. Melville T. Johnson, Atlanta, aged 78, died recently.

Dr. James West Meaders, Macon, aged 86, died recently.

Dr. Charles Seaborn Middleton, Blakely, aged 74, died recently.

Dr. Benjamin Ivy O'Kelly, Round Oak, aged 74, died recently.

Dr. Charles Manfred Stephens, Waycross, aged 63, died recently.

Dr. Charles Sherman Smith, Clarksville, aged 82, died recently of organic heart disease.

Dr. Philip Bartow Bedingfield, Wrightsville, aged 84, died recently of a heart attack.

Dr. James Munrow Daves, Blue Ridge, aged 85, died April 12.

Dr. Arthur Paton Hanie, Hartwell, aged 77, died recently.

Dr. George T. Kesner, Atlanta, aged 83, died April 16.

Dr. John Arnold Pirkle, Monroe, aged 76, died recently.

KENTUCKY

Dr. Paul F. Orr, U. S. Public Health Service, has resigned as Health Officer, Nelson, Bullitt and Spencer counties to enter private practice.

Dr. Mildred E. B. Gabbard, Harrodsburg, has resigned as Health Officer, Mercer County Health Department.

Dr. George M. Jewell, Mayfield, has resigned as Health Officer, Graves County.

Dr. Benjamin F. Reynolds, Carlisle, succeeds Dr. Robert L. Loftin, Cynthiana, as Health Officer, Nichols County. Dr. Loftin has accepted a similar position in Bay City, Michigan.

Dr. Harlan V. Usher, Sedalia, succeeds Dr. George M. Jewell as Health Officer, Graves County. Dr. Jewell has entered private practice in Kokomo, Indiana.

Continued on page 62

A-O May Ophthalmoscope

This instrument incorporates a precision optical system insuring a concentrated light of equal intensity over the illuminated area for highly efficient diagnosis.

A totally reflecting prism, two condensing lenses, pinhole diaphragm and specially designed lamp provide a light beam allowing examination of the fovea with an undilated pupil. Corneal reflexes are minimized. The illuminated dial allows determination of lens power under dark-room conditions. Either battery or cord handles are made available for either of the models.

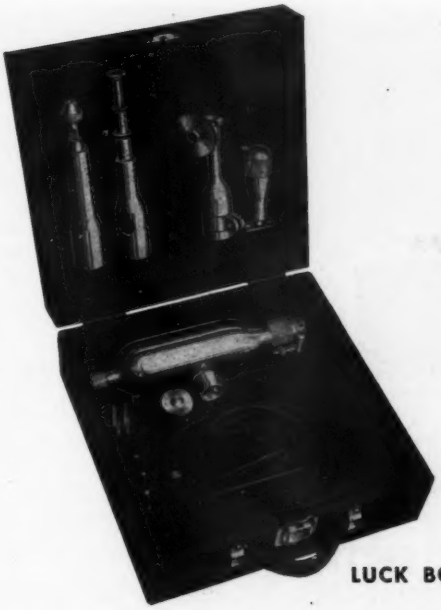
Single Disc Model . . . . . +20.00D to —20.00D

Double Disc Model . . . . . +29.00D to —30.00D

Order Now For Early Delivery

American Optical

COMPANY



LUCK BONE SAW

MODERNIZE

with Zimmer bone operating equipment!

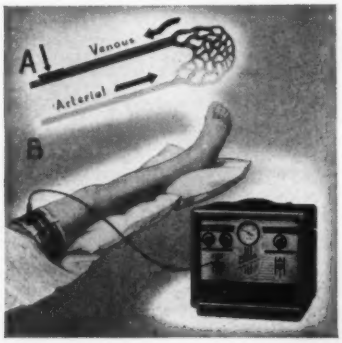
The LUCK BONE SAW (shown above) relieves the surgeon of tiresome hand drilling and cutting. The high speed slotting burrs are invaluable in bone graftings.

ZIMMER'S BONE CLAMP incorporates features heretofore unknown for such instruments.

The TWO-SPEED HAND DRILL is the answer to a demand for a UNIVERSAL tool of this kind.

These and many other new items now available.

Zimmer
MANUFACTURING CO., WARSAW, IND.



A. Compression with rhythmic constriction and release results in dilatation of small blood vessels and capillaries.

B. Increased blood supply following rhythmic constriction relieves circulatory stasis, which is indicated by color change toward normal, with increase in temperature and relief of symptoms.

RHYTHMIC CONSTRICTION

for the RELIEF of INADEQUATE PERIPHERAL CIRCULATION

Vascular diseases are today a leading cause of disability and discomfort.

Research studies have shown that a filling and stretching of the capillary bed follows the intermittent application of sub-diastolic pressure to the proximal portion of an extremity.

This therapeutic effect is produced by the Rhythmic Constrictor, which automatically increases and relaxes pressure within a pneumatic cuff applied around the diseased extremity.

Subjectively, it is noted that pain is relieved, and warmth returns to the skin.

Objectively, increased vascularity is observed and an increase in the oscillometric curves may be obtained in many cases of organic vascular obstruction.

Indicated in:

- Arteriosclerosis
- Diabetic ulcers and gangrene
- Acute vascular occlusion
- Early thromboangiitis obliterans
- Intermittent claudication
- Chilblains

THE Burdick RC-2 RHYTHMIC CONSTRICTOR

Dual Timing and periods of Compression and Release are independently set, permitting any combination. Adapted to any recommended technic. Simple—portable—quiet.

THE BURDICK CORPORATION
MILTON WISCONSIN

Continued from page 60

Dr. Russell E. Teague, Louisville, has resigned as Director of Tuberculosis Control for the Kentucky State Department of Health to carry on similar activities for the U. S. Public Health Service.

Dr. and Mrs. D. R. Skagga, Royalton, recently celebrated their fiftieth wedding anniversary.

The Keys-Houston Clinic Hospital has been changed to Houston-McDevitt Clinic, Incorporated, Murray. The staff is composed of Dr. Hugh L. Houston, Dr. Hal E. Houston, Dr. Coleman J. McDervitt, Dr. Robert W. Hahs, Dr. C. H. Jones and Dr. A. D. Butterworth, all of Murray.

DEATHS

Dr. William Wesley Anderson, Fort Thomas, aged 79, died recently of anterior coronary occlusion.

Dr. James Asher Caldwell, Southgage, aged 74, died recently of cerebral hemorrhage.

Dr. Amplias W. Davis, Madisonville, aged 72, died recently.

Dr. Henry L. Rapp, Louisville, aged 74, died April 15.

Dr. Edgar T. Riley, Frenchburg, aged 71, died recently of cerebral hemorrhage.

Dr. Wilson Lewis Vickers, Franklin, aged 61, died recently of bronchopneumonia.

Dr. James D. Whittaker, Cannel City, aged 74, died recently of arteriosclerotic heart disease.

LOUISIANA

Louisiana Tubercu'osis Association at its recent annual meeting in Alexandria, May 5, re-elected Dr. Julius Lane Wilson, President; Dr. Sydney Jacobs and Dr. Maurice Campagna, Vice-Presidents; Dr. J. A. Danna, Dr. Edgar Hull, Dr. John H. Musser, Dr. I. L. Robbins, Dr. Suzanne Schaefer and Dr. John M. Whitney, members of the Executive Committee, all of New Orleans.

Medical Toastmasters has re-elected Dr. Edwin L. Zander, President; Dr. Philip H. Jones, Vice-President; Dr. Lawrence J. O'Neil, Secretary-Treasurer; Dr. J. A. Colclough, Sergeant-at-Arms; and Dr. Charles A. Bahn, Deputy, all of New Orleans.

Dr. Hiram W. Kostmayer, New Orleans, was recently elected to honorary membership in the Tulane History of Medicine Society.

Dr. H. Ashton Thomas has been appointed a member of the Board of the New Orleans City Health Department; and Dr. Boni J. DeLaureal and Dr. John M. Whitney, re-appointed.

Dr. George Warren Prather, New Orleans, and Miss Kathleen Elaine Helphen, Opelousas, were married recently.

DEATHS

Dr. Arthur Lewis Loebel, New Orleans, aged 28, died recently.

MARYLAND

Dorchester County Medical Society has elected Dr. Hugh Brown, Cambridge, President; Dr. James B. Homan, Hurlock, Vice-President; and Dr. E. A. Jones, Cambridge, Secretary-Treasurer.

Frederick County Medical Society has elected Dr. Howard W. Ash, Frederick, President; Dr. Carol Easterday, Walkersville, and Dr. H. L. Fahrney, Frederick, Vice-Presidents; Dr. B. O. Thomas Jr., Frederick, Secretary; and Dr. L. R. Schoolman, Frederick, Treasurer.

Harford County Medical Society has elected Dr. Josiah S. Hust, Cardiff, President; Dr. Charles J. Foley, Havre de Grace, Vice-President; and Dr. J. R. Horky, Churchville, Secretary-Treasurer.

Howard County Medical Society has held over last year officers as follows: Dr. B. Bruce Brumbaugh, Elkridge, President; Dr. Louis Brown, D.D.S., Vice-President; and Dr. Sigmund Goldberg, Ellicott City, Secretary-Treasurer.

Kent County Medical Society has held over last year officers as follows: Dr. A. F. Whitsitt, Chestertown, President; Dr. James E. Dedman, Betterton, Vice-President; and Dr. A. C. Dick, Chestertown, Secretary-Treasurer.

Montgomery County Medical Society has elected Dr. Emil G. Bauersfeld, Bethesda, President; Dr. Opton D. Nourse, Dawsonville, Vice-President; Dr. J. W. Bird, Sandy Spring, Secretary; and Dr. J. Marion Bankhead, Silver Spring, Treasurer.

Prince George's County Medical Society has elected Dr. John Maloney, Hyattsville, President; Dr. William Brainin, Capitol Heights, Vice-President; and Dr. George Hagleage, Cottage City, Secretary-Treasurer.

Queen Anne's County Medical Society has elected Dr. H. F. McPherson, President; Dr. W. H. Fisher, Vice-President; and Dr. C. Rodney Layton, Secretary-Treasurer, all of Centerville.

St. Mary's County Medical Society has elected Dr. Frank

Continued on page 64

100 ADHESIVE BANDAGES 1" x 3"
BAND-AID
ADHESIVE BANDAGES
Johnson & Johnson
BREAK AT PERFORATION AND TEAR OFF FOR DISPENSING
BAND-AID
Tyrothricin
IS THE BIG
BAND-AID*
NEWS!
In the new
Wall-type Dispenser
• Tyrothricin, the amazingly effective topical antibiotic, is now incorporated in this *newest* Band-Aid Adhesive Bandage.
What's more, this compact, sterile adhesive compress is *now available* in the professional box which also serves as a handy wall dispenser. Just open at end and 100 adhesive bandages (1"x3") are at your fingertips. Saves time—saves waste—gives extra protection.
ORDER FROM YOUR DEALER
Johnson & Johnson
NEW BRUNSWICK, N. J. CHICAGO, ILL.
*BAND-AID is the Reg. Trade-mark of the adhesive bandage made exclusively by Johnson & Johnson.

Continued from page 62

A. Camalier, Great Mills, President; Dr. Robert V. Palmer, Avenue, Vice-President; and Dr. William H. Patrick, Pearson, Secretary-Treasurer.

Somerset County Medical Society has elected Dr. William H. Coulbourn, Crisfield, President; and Dr. Henry M. Lankford, Princess Anne, Secretary-Treasurer.

Talbot County Medical Society has elected Dr. James H. Hope, St. Michael's, President; Dr. William T. Hammond, Easton, Vice-President; Dr. S. Dennis Willson, St. Michael's, Second Vice-President; and Dr. Joseph A. Ross, Trappe, Secretary-Treasurer.

Washington County Medical Society has elected Dr. R. V. Hauver, President; Dr. F. F. Lusby, Vice-President; and Dr. Jack H. Beachley, Secretary-Treasurer, all of Hagerstown.

Wicomico County Medical Society has elected Dr. R. M. Nock, Salisbury, President; Dr. Jack K. Williams, Salisbury, Vice-President; and Dr. Lee L. Lawry, Jr., Fruitland, Secretary-Treasurer.

Worcester County Medical Society has elected Dr. N. E. Sartorius, Pocomoke City, President; and Dr. Robert C. LaMar, Snow Hill, Secretary-Treasurer.

Dr. Gayle G. Arnold and Miss Elizabeth Key Boyle, both of Baltimore, were married recently.

Dr. Stanton L. Collins, Fort George Meade, and Miss Anne Keith, Columbia, South Carolina, were married April 7.

DEATHS

Dr. Louis Hamman, Baltimore, aged 68, died April 28 of myocardial infarction.

MISSISSIPPI

Dr. Frank L. Fisher, for more than two years physician to the Alabama Dry Dock and Shipbuilding Company, Mobile, has been named to a similar position with the Ingalls Shipbuilding Corporation, Pascagoula. He will direct the entire medical program among the employees.

DEATHS

Dr. John H. Beavers, Wesson, aged 74, died recently.

STERILE HIGH TITER

GROUP SERA

For ACCURATE CLASSIFICATION

Improper classification, due to weak reacting testing sera or failure to differentiate A1 from A2 bloods may cause serious trouble—even fatalities.

Our Grouping Sera are certified for HIGH TITER. Exclusively prepared under the personal supervision of Dr. R. B. H. Gradwohl for safe, efficient, *accurate* laboratory technique. We invite your inquiries.

Serum "A" (II, Moss), and Serum "B" (III Moss) represent carefully controlled experimental work to furnish the profession *carefully tested and titrated* grouping sera. Clinically reliable . . . worthy of your confidence. Anti-Rh serum to test for Rh. Absorbed B serum to differentiate between A_1 and A_2. Anti-M and Anti-N sera for blood spots and paternity work.

Write for a sample copy of The Gradwohl Laboratory Digest full of helpful hints on improved laboratory technique.

GRADWOHL
LABORATORIES
R. B. H. Gradwohl, M. D., Director
3514 Lucas Av. St. Louis, Mo.

MISSOURI

Dr. Brian Blades, Lieutenant Colonel, Medical Corps, U. S. Army, Chief of the Thoracic Section, Walter Reed General Hospital, Washington, D. C., and formerly of St. Louis, succeeds Dr. Charles Stanley White as Professor of Surgery, George Washington University School of Medicine, Dr. White having retired.

Dr. Cyril M. MacBryde, St. Louis, has been appointed Assistant Clinical Professor of Medicine, University of Southern California School of Medicine, Los Angeles, California.

Dr. Buford G. Hamilton, Kansas City, has retired from practice after forty years in obstetrical work in Kansas City.

Dr. M. P. Leech, Fayette, is a junior partner at Lee Hospital, Fayette, with Dr. W. A. Bloom and Dr. W. J. Shaw.

Dr. Leo V. Mulligan, St. Louis, and Miss Elizabeth Leyse, Decatur, Indiana, were married recently.

Dr. Franklin P. Reulbach, St. Louis, and Miss Hazel Gene Farrow, Crystal City, were married recently.

DEATHS

Dr. John Pearl Allen, Cairo, aged 69, died recently of carcinoma.

Dr. William H. Becker, St. Louis, aged 70, died recently of carcinoma of the liver.

Dr. Charles King Dutton, Moberly, aged 75, died recently of heart disease.

Dr. August Frederick Henke, St. Louis, aged 72, died recently of carcinoma.

Dr. John Rogers Hudson, St. Louis, aged 89, died recently.

Dr. Henry C. Werner, Meta, died recently.

NORTH CAROLINA

Medical Society of the State of North Carolina at its recent annual meeting held at Pinehurst elected and installed Dr. W. M. Coppridge, Durham, President; and elected Dr. Frank A. Sharpe, Greensboro, President-Elect (because there was no meeting last year it was necessary to elect a President and President-Elect); Dr. George E. Bell, Wilson, First Vice-President; Dr. James B. Bullitt, Chapel Hill, Second Vice-President; and Dr. Roscoe D. McMillan, Red Springs, Secretary-Treasurer, re-elected.

American Physiotherapy Association will hold its meeting at Black Mountain, June 16-22.

Southern Pediatric Seminar will hold its 26th session at Saluda, July 15-27, under the leadership of Dr. D. L. Smith, Spartanburg, South Carolina.

Dr. W. C. Davison, Durham, has been elected to fill the vacancy on the Editorial Board of the North Carolina Medical Journal created by the death of Dr. Fred Hanes. Dr. Hubert Royster, Raleigh, and Dr. Coy Carpenter, Winston-Salem, were re-elected to the Board for four-year terms.

North Carolina Obstetrical and Gynecological Society at its recent meeting elected Dr. Wallace B. Bradford, Charlotte, President; Dr. T. D. Tyson, High Point, Vice-President; and Dr. Richard B. Dunn, Greensboro, Secretary and Treasurer.

Dr. Hubert A. Hudgins, Rutherfordton, has been appointed Health Officer for Cleveland County. He was Health Officer of Rutherford and Polk Counties before entering military service.

Dr. Glenn S. Edgerton, Statesville, has opened an office in Greensboro for the practice of obstetrics and gynecology.

Dr. John Bonner, Aurora, was recently elected Vice-President, Pasquotank Tuberculosis Association.

Dr. J. P. Hunter, Cary, has been elected First Vice-President, Wake County Tuberculosis Association.

Dr. A. J. Lehman, Professor of Pharmacology, University of North Carolina School of Medicine, Chapel Hill, resigned his position effective July 1 to assume the position as Chief of the Division of Pharmacology of the Food and Drug Administration, Federal Security Agency, Washington, D. C.

Dr. Herman G. Baity, Professor of Sanitary Engineering, University of North Carolina School of Medicine, Chapel Hill, has been appointed Acting Dean of the School of Public Health to serve in place of the late Dr. Milton J. Rosenau, Dean of the school since 1935.

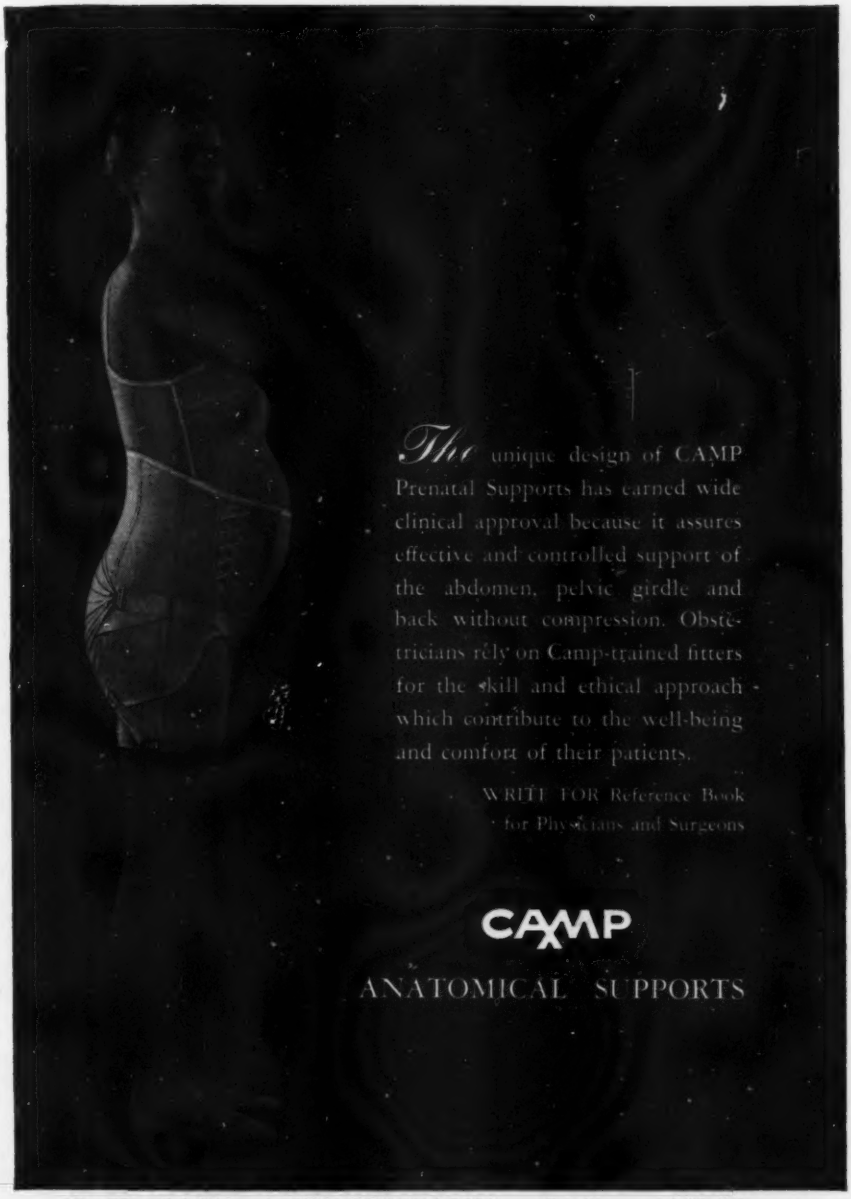
Dr. Valy Menkin, Assistant Professor of Pathology, Duke University School of Medicine, Durham, has been appointed Associate Professor of Experimental Pathology in the newly created Department of Surgical Research, Temple University School of Medicine, Philadelphia, Pennsylvania.

Dr. Walter Samuel Lockhart Jr., Durham, and Miss Doreen Ethel Steele, Guilford, Connecticut, were married recently.

Dr. Frank Russell Reynolds, Wilmington, and Miss Marguerite Murchison Crow, were married recently.

Dr. Laurence Edwin Fleming and Miss Dorothy Hutchison Sarratt, both of Charlotte, were married recently.

Continued on page 68


The unique design of CAMP Prenatal Supports has earned wide clinical approval because it assures effective and controlled support of the abdomen, pelvic girdle and back without compression. Obstetricians rely on Camp-trained fitters for the skill and ethical approach which contribute to the well-being and comfort of their patients.
WRITE FOR Reference Book for Physicians and Surgeons
CAMP
ANATOMICAL SUPPORTS

S. H. CAMP AND COMPANY • Jackson, Michigan

World's Largest Manufacturers of Scientific Supports

Offices in New York • Chicago • Windsor, Ontario • London, England

Systemic
Rehabilitation
Each Capsule Contains:
Vitamin D (Irradiated Ergosterol)....50,000 U.S.P.
Vitamin A (Fish-Liver Oil).....5,000 U.S.P.
Ascorbic Acid
Thiamine Hydrochloride
Riboflavin
Pyridoxine Hydrochloride
Calcium Pantothenate
Niacinamide
Mixed Natural Tocopherols
(Equivalent in biological activity to 3 mg. of Alpha,

..A PRIMARY NEED IN ANTARTHRITIC THERAPY

Recognition of the systemic nature of chronic arthritis and the multiphasic involvement it engenders has led to the present method of treating the arthritic patient as a whole, not merely the involved joints.

A complete therapeutic program is needed—one which includes orthopedic measures, elimination of foci of infection, physical therapy, rest, supervised exercise, and correction of disturbed physiologic functions.

Darthronol has proved an important integral part of such a therapeutic program. By the pharmacodynamic and nutritional actions of its nine constituents, it not only exerts a beneficial influence on the disturbed locomotor structures but in addition proves of value in the elimination of many systemic disturbances encountered in the arthritic syndrome.. Comprehensive literature on request.

J. B. ROERIG & COMPANY
536 Lake Shore Drive · Chicago 11, Illinois

DARTHRONOL *for the Arthritic*
a ROERIG *Preparation*

Continued from page 64

Dr. William Louis Bingham, Lexington, and Miss Evelyn Gray Whittenton, Dunn, were married recently.
Dr. Robert Linton Ralston, Henderson, and Miss Ruth Alice McBride, Boston, Massachusetts, were married recently.
Dr. William Joseph May, Thomasville, and Miss Doris Elizabeth Burke were married recently.

DEATHS

Dr. A. W. James, Laurinburg, aged 52, died April 4.
Dr. Charles Bernard Herman, Statesville, aged 46, died recently.

OKLAHOMA

Dr. John H. Lamb, Oklahoma City, has been selected Chairman of the Fund for Advancement of Medical Science, created by the Alumni Association of the University of Oklahoma School of Medicine, Oklahoma City.

DEATHS

Dr. John Winston Adams Sr., Chandler, aged 67, died recently of cerebral hemorrhage.
Dr. Pirl B. Myers, El Reno, aged 57, died recently of coronary occlusion.
Dr. Charles Edward Smith, Oklahoma City, aged 72, died recently of influenza and pneumonia.
Dr. Claud E. Wann, Albany, aged 79, died recently of arteriosclerosis.

SOUTH CAROLINA

South Carolina Medical Association at its recently annual meeting held in Myrtle Beach installed Dr. James McLeod, Florence, President; and elected Dr. Olin Burnham Chamberlain, Charleston, President-Elect.
Laurens County Medical Society has elected Dr. James Dusenberry, Laurens, President; Dr. G. R. Blalock, Clinton, Vice-President; and Dr. D. O. Rhame, Clinton, Secretary-Treasurer.
Dr. R. S. Matthews is Medical Director, Edgewood Sanitorium, Aiken, and Dr. Orin R. Yost, is Superintendent. This is a sanitorium devoted to the treatment of mental diseases.
Dr. R. N. Barnett has resigned as Pathologist, Providence and Veterans' Hospitals, Columbia, to take a position as Instructor at Yale University.
Dr. Fletcher Jordan, Greenville, was honored recently when some two thousand friends gathered for a surprise party, presenting him with a silver set "in token for his service to mankind," he having completed forty years of service to patients in Greenville.
Dr. James E. Fender, Bamberg, and Miss Betty Petty, Belleville, Illinois, were married recently.
Dr. H. M. Allison and Miss Betty Williams, both of Greenville, were married April 27.
Dr. Hugh Haynesworth Wells, Holly Hill, and Miss Beverly Jane Carey, Oxford, North Carolina, were married April 9.
Dr. La Rue Merida Medlin, Bennettsville, and Miss Marie Elizabeth Hammond, Fairfax, were married April 6.

DEATHS

Dr. Robert Wilson, Charleston, aged 78, died May 20 of coronary thrombosis complicated with pneumonia.
Dr. C. C. Ariail, Greenville, aged 56, died May 18.
Dr. Lucius Cuthbert Brooker, Swansea, aged 65, died April 2.
Dr. David S. Keisler, Leesville, aged 68, died recently.
Dr. B. M. Montgomery, Kingstree, aged 58, died April 2.
Dr. E. R. Donnald, Honea Path, aged 69, died April 6.
Dr. G. C. Bolin, Orangeburg, aged 62, died recently.
Dr. Robert Seibels Jr., Columbia, died recently.
Dr. William C. Thompson, Waterloo, aged 71, died recently.

TENNESSEE

Tennessee State Medical Association at its recent annual meeting installed Dr. C. M. Hamilton, Nashville, President; and elected Dr. Franklin B. Bogart, Chattanooga, President-Elect; Dr. J. Paul Baird, Dyersburg, Vice-President for West Tennessee; Dr. W. A. Howard, Cookeville, Vice-President for Middle Tennessee; Dr. Lea Callaway, Maryville, Vice-President for East Tennessee; and Dr. W. M. Hardy, Nashville, Secretary-Editor, re-elected.
Dr. M. K. Moulder, formerly of Nashville, announces his return from military service and his association with the Medical and Surgical Clinic, Longview, Texas, practice limited to urology and urologic surgery.
Dr. Hugh J. Morgan, Brigadier General, Medical Corps, U. S. Army, Nashville, has been awarded the Distinguished Service Medal.
Dr. Albert P. Ohlmacher, Chattanooga, and Mrs. Jean Vandergrift, Sewanee, were married recently.

DEATHS

Dr. James David Daniel, Daniels Landing, aged 77, died recently of massive pulmonary hemorrhage.
Dr. Otey James Porter, Columbia, aged 78, died recently of pneumonia.
Dr. George Pierce Willbanks, Chattanooga, aged 88, died April 1.

TEXAS

Gray-Wheeler Counties Medical Society has elected Dr. R. M. Bellamy, Pampa, President; Dr. G. R. Walker, Wheeler, Vice-President for Wheeler County; Dr. K. W. Pieratt, Pampa, Vice-President for Gray County; and Dr. W. Purviance, Pampa, Secretary-Treasurer.

Continued on page 70

Classified Advertisements

WANTED—Physicians for health officer positions in county and district health departments in Oklahoma. Salary range according to public health training and experience $4800 to $6600 plus travel expense. Beginning salary with no previous training or experience $4200 to $4800 plus travel expense. Address Commissioner of Health, Oklahoma State Department of Health, Oklahoma City 5, Oklahoma.

HOSPITAL FOR SALE OR LEASE—For information or particulars address inquiries to Dr. J. R. Lowery, Lowery Hospital, Salisbury, North Carolina.

"very satisfactory ... in securing prompt and prolonged relief" in bronchial asthma, says Dees (J. Allergy 14:492, 1943) of Aminophyllin rectal suppositories.

ACCEPTED AMERICAN MEDICAL ASSN.

Very satisfactory are...
DUBIN AMINOPHYLLIN
RECTAL SUPPOSITORIES (0.36 Gm. each)
Dubin Aminophyllin (theophylline-ethylenediamine) also in Tablets, Ampuls, Powder for rapid action in many indicated cardio-respiratory conditions.
H. E. DUBIN LABORATORIES, Inc., 250 East 43rd St., New York 17, N.Y.

CIBA

● An announcement will soon be made regarding a new Ciba product. It will be of such wide application that every physician will want to be informed.

CIBA PHARMACEUTICAL PRODUCTS, INC., SUMMIT, NEW JERSEY

In Canada: Ciba Company Limited, Montreal

Continued from page 68

Hale-Floyd-Briscoe-Swisher Counties Medical Society has elected Dr. George V. Smith, Floydada, President; Dr. E. P. Stewart, Tulia, Vice-President; and Dr. L. C. Wayland, Plainview, Secretary-Treasurer.

Jasper-Newton Counties Medical Society has elected Dr. James N. Seale, Jasper, President; Dr. A. J. Richardson, Jasper, Vice-President; and Dr. G. Mason Graham, Bessmay, Secretary-Treasurer.

Karnes-Wilson Counties Medical Society has elected Dr. S. E. Shannon, Karnes City, President; Dr. H. J. Bonnstetter, Kenedy, Vice-President; and Dr. J. V. Blake Jr., Floresville, Secretary-Treasurer.

Medina-Uvalde-Maverick-Val Verde-Edwards-Real-Kinney-Terrell-Zavala Counties Medical Society has elected Dr. Hershall La Forge, Uvalde, President; Dr. Norvill Graham, Del Rio, Vice-President; and Dr. Orin McMillan, Eagle Pass, Secretary-Treasurer.

Nueces County Medical Society has elected Dr. T. W. Edwards, President; Dr. N. D. Carter, Vice-President; and Dr. Foy H. Moody, Secretary-Treasurer, all of Corpus Christi.

Palo Pinto-Parker Counties Medical Society has elected Dr. W. B. Lasater, President; Dr. C. B. Williams, Vice-President; and Dr. E. F. Yeager, Secretary, all of Mineral Wells.

Potter County Medical Society has elected Dr. R. R. Swindell, President; Dr. E. A. Rowley, Vice-President; and Dr. George M. Waddill Jr., Secretary-Treasurer, all of Amarillo.

Shelby-San Augustine-Sabine Counties Medical Society has elected Dr. W. C. Windham, President; Dr. T. L. Hurst, Vice-President; and Dr. W. H. Warren, Secretary-Treasurer, all of Center.

Upshur County Medical Society has elected the following officers to serve for two years: Dr. W. Looney Fenlaw, President; and Dr. Hugh M. Ragland, Secretary, both of Gilmer.

Walker-Madison-Trinity Counties Medical Society has elected Dr. M. D. Hanson, Huntsville, President; Dr. Jesse B. Heath, Madisonville, Vice-President; and Dr. W. B. Veazey, Huntsville, Secretary-Treasurer.

Wilbarger County Medical Society has elected Dr. Alvin L. Borchardt, Vernon, President; Dr. Joe Shipman, Vernon, Vice-President; and Dr. Raymond A. Lemee, Dallas, Secretary-Treasurer.

Third (Panhandle) District Medical Society has installed Dr. George L. Powers, President; and elected Dr. A. E. Winsett, President-Elect; and re-elected Dr. George L. Powers, Secretary, all of Amarillo.

Eleventh District Medical Society has elected Dr. L. L. Travis, Jacksonville, President; Dr. Leroy Trice, Palestine, Vice-President; and Dr. C. B. Young, Tyler, Secretary-Treasurer, for a four-year period.

American Association for the Surgery of Trauma will hold its meeting at San Antonio, June 26-28. Plaza Hotel will be headquarters but the program on Thursday afternoon, June 27, will be held at the School of Aviation Medicine at Randolph Field.

A Veterans Hospital with five hundred beds has been authorized for Dallas which will probably cost around $5,500,000, and will be constructed near the Southwestern Medical College.

Dr. Lorence W. Feller, Fredericksburg, has been named the outstanding young man in his city during 1945 and was presented the distinguished service award of the Fredericksburg Junior Chamber of Commerce recently.

Dr. James H. Baxter, Assistant Professor of Medicine, Southwestern Medical College, Dallas, has been awarded the Welch Fellowship in Internal Medicine for an initial period of three years from July 1.

Dr. A. O. Scarborough, Mineral Wells, has retired from practice.

Dr. R. L. Cherry has resigned as Associate Director of Public Health and Chief of the Communicable Disease Division in San Antonio to become Chief Medical Officer of the Inter-American field party in Bolivia, under the Health and Sanitary Division of the Office of Inter-American Affairs.

Dr. Jerome Olkin Ravel and Miss Marjorie Joanne Macow, both of Austin, were married recently. They will reside in Galveston where Dr. Ravel is a resident at John Sealy Hospital.

Dr. Joe A. Walker, Huntington, and Miss Gwendolyn Rawls, Wichita Falls, were married recently.

Dr. Jack R. Walton, Midland, and Miss Lillian Clark, Fayette, Iowa, were married recently.

Deaths

Dr. Joseph Reuss Frobese, Austin, aged 62, died recently.

Dr. George Yerger Hicks, aged 39, died recently of gastric hemorrhage.

Dr. William Cook Lackey, Fort Worth, aged 71, died April 5.

Dr. Wiley H. Ward, Cumby, aged 79, died recently of coronary heart disease.

VIRGINIA

McGuire General Hospital was recently transferred from the Army to the Veterans Administration and is being set up as a 1,000-bed institution, with Dr. Edmund M. Ellerson, Staunton, as manager of the hospital. The following have been selected from the staff of the Medical College of Virginia, Richmond, for positions on the staff: Dr. James P. Baker and Dr. Charles Caravati, Medical Consultants; Dr. A. Stephens Graham, Dr. Guy W. Horsley, and Dr. Harry J. Warthen, Surgical Consultants; Dr. Frank P. Coleman, Dr. Patrick H. Drewey Jr., Dr. Marshall P. Gordon Jr., Dr. William R. Hill, Dr. William A. Johns, Dr. John R. Massie Jr., Dr. Sidney G. Page, Dr. Allen W. Pepple, Dr. E. W. Perkins, Dr. W. Morris Pinckney, Dr. Reno R. Porter, Dr. Benjamin W. Rawls Jr., Dr. Wellford C. Reed, Dr. Edwin M. Rucker, Dr. R. C. Siersema, Dr. W. Taliaferro Thompson Jr., Dr. Elam C. Toone Jr., Dr. Charles E. Troland, Dr. Gilmer R. Tyler and Dr. T. Duval Watts, attending physicians. Dr. Benedict Nagler, Newark, New Jersey, is Chief of Neuropsychiatric Service; Dr. Samuel Richmond, New York City, Chief of Roentgenological Service; Dr. James B. Funkhouser, Marion, Assistant to Dr. Nagler; and Dr. Joseph Krimsky, Charlottesville, Assistant Chief of Eye, Ear, Nose and Throat Service. Dr. Grant R. Elliott, Orange, has accepted a position on the staff.

Medical College of Virginia, Richmond, announces the new appointments: Dr. Randall L. Thompson, Associate Professor of Bacteriology and Parasitology; Dr. William A. Summers, Assistant Professor of Bacteriology and Parasitology; Dr. Charles E. Troland, Assistant Professor of Neurological Surgery; Dr. Delbert

Continued on page 72

LaMOTTE BLOOD CHEMISTRY SERVICE

LaMOTTE THIOCYANATE OUTFIT

The positive control of the blood thiocyante content during administration of this compound is of the utmost importance. Analytical methods for thiocynates have long been used in chemical laboratories and the LaMotte Outfit uses one of these procedures. The specimen of blood is treated according to instructions and the developed color in the specimen is compared with color standards. Complete outfit with instructions. Price, $22.50 f.o.b. Towson 4, Maryland.

This service includes a series of similar outfits for conducting the following accurate tests: Blood Sugar, Blood Urea, Icterus Index, Phenosulfonphthalein, Urine pH, Blood pH, Gastric Acidity, Calcium-Phosphorus, Blood Bromides and Sulfonamide Compounds.

If you do not have the LaMotte Blood Chemistry Handbook, a complimentary copy will be sent upon request without obligation.

LaMOTTE CHEMICAL PRODUCTS COMPANY

Dept. S **Towson 4, Maryland**

GOVERNMENT SURPLUS

. . . approximately 1/3 list, quality fully certified

We have obtained from War Assets Corporation a large quantity of the excellently made instruments illustrated which we can offer at the following very favorable prices.

3B122G — Kirschner Hand Drill (A), chrome plated body with stainless steel chuck, complete with 3 twist drills, sizes 1/16", 3/32", and 1/8-inch, standard price $29.50, special, only.....$10.00

3B123G — Bohler-Steinman Pin Set, consisting of chrome plated Adjustable Chuck Handle (B), one each stainless steel Bohler-Steinman Pin Holders (B and C), medium adult and child sizes, standard price $14.50, special, only.....$5.85

3B124G — Special Bone Set, consisting of one each of the above listed instruments, standard price $44.00, special, only.....$12.50

A. S. ALOE COMPANY — 1831 Olive St. — St. Louis 3, Mo.

For the Failing Heart

Phyllicin

A "theophylline" for oral administration — quick acting and well tolerated. For the relief of cardiac distress and pain, to diminish dyspnoea and to reduce edema.

DOSE: 1 or 2 tablets (4 grains each) after meals.

Phyllicin, brand of theophylline-calcium salicylate, Trade Mark reg. U. S. Pat. Off.

Bilhuber-Knoll Corp. Orange, N. J.

Continued from page 70

V. Keckele, Assistant Professor of Radiology; and Dr. T. Wiley Hodges, Assistant Professor of Orthopedic Surgery.

Alexandria Medical Society has elected Dr. James A. Gooch, President; Dr. C. E. Arnette, Vice-President; and Dr. R. F. Benthall, Secretary-Treasurer, all of Alexandria.

Buchanan-Dickenson County Medical Society has elected Dr. C. H. Reagan, Grundy, President; Dr. Thornton Kell, Grundy, Vice-President; and Dr. T. C. Sutherland, Haysi, Secretary-Treasurer.

Hopewell (Virginia) Medical Society has elected Dr. F. M. Howell, Hopewell, President; and Dr. J. S. Williams, Richmond, Secretary.

Roanoke Academy of Medicine has elected Dr. Charles A. Young, President; and Dr. Wade H. Saunders, Secretary-Treasurer, both of Roanoke.

Virginia Peninsula Academy of Medicine has elected Dr. Robert H. Wright Jr., Phoebus, President; Dr. George G. Hankins, Newport News, Vice-President; and Dr. Chester D. Bradley, Newport News, Secretary-Treasurer, re-elected.

Virginia Cancer Foundation at its recent meeting held in Richmond, elected Dr. William T. Sanger, Richmond, President; Dr. Julian L. Rawls, Norfolk, Vice-President; and Dr. George Cooper Jr., University, Director, re-elected; Dr. Guy Horsley, Richmond, Dr. Joseph Houck, Lynchburg, and Dr. Alfred Jones, Roanoke, new Directors; and Dr. George Z. Williams, Richmond, Dr. Cooper, Dr. Harvey E. Jordan, University and Dr. L. C. Downing, Roanoke, Directors, re-elected.

Dr. Thomas E. Painter, formerly of Radford, is associated with Westbrook Sanatorium, Richmond.

Dr. Wilbur R. Southward, Richmond, has been appointed Assistant Director, Medical Services of the Richmond Branch Office, Veterans Administration. He will assist in supervising medical services at their hospitals, homes and offices in Virginia, North Carolina, Maryland, West Virginia, and the District of Columbia.

Foley

FOOD MILL

Conserves mother's time and energy in straining fresh vegetables and fruits. With just a few twists of the wrist, the Foley Food Mill separates fibres and hulls and purees any cooked food fine enough for the smallest baby or for any adult diet—peas, carrots, beets, string beans, spinach, apple sauce, prunes. Made of steel, rust- and acid-resistant. At department and hardware stores.

Regular price $1.50. Special price to doctors, for display, 1 only $1.00 postpaid.

FOLEY MFG. CO. 85-7 Second St. N. E. Minneapolis 13, Minn.

I enclose $1.00 for 1 Household Size Foley Food Mill.

Name_____

Address_____

Dr. D. I. Farnsworth, Richmond, is connected with the Veterans Administration at Oteen, North Carolina.

Dr. A. B. Gravatt Jr., Kilmarnock, has been appointed Lancaster County Coroner to succeed the late Dr. M. C. Oldham.

Dr. S. D. Gardner, Assistant Director of Rural Health, State Department of Health, has resigned to enter private practice in San Antonio, Texas.

Dr. J. Belmont Woodson, Superintendent and Medical Director, Piedmont Sanatorium, has resigned after fifteen years with that institution.

Dr. V. A. Turner, Health Officer for Augusta County before entering military service, is Assistant Director of Local Health Services, with headquarters in the Southwest District Office in Abingdon.

Dr. Cameron F. McRae, recently released from Army service, has been appointed Health Officer, Russell-Wise Health District.

Dr. P. M. Chichester, Assistant Director of Local Health Services was on May 1 transferred from the Southwest District Office at Abingdon to the Central Office, Richmond.

Dr. J. McIver Jackson, Manassas, has resigned as Health Officer, Norfolk-Princess Anne Health District.

Dr. W. W. Griggs, Newport News, has resigned as Health Officer of the Page-Warren-Shenandoah Health District.

American Orthopaedic Association will hold its 1946 meeting at the Homestead Hotel, Hot Springs, June 27-29, under the presidency of Dr. James A. Key, Cardston, Alberta, Canada.

Virginia Society of Ophthalmology and Otolaryngology at its recent meeting installed Dr. Thomas Hughes, Richmond, President; and elected Dr. Fred Hamlin, Roanoke, President-Elect; and Dr. Francis H. McGovern, Danville, Secretary-Treasurer, re-elected. The 1947 meeting will be held next May in Norfolk.

Dr. I. C. Riggin, Richmond, and Dr. Julian L. Rawls, Norfolk, have been appointed by the Governor as members of the Legislative Commission, created by the last General Assembly to study private organizations which solicit funds from the public for medical care.

Dr. T. B. Pope, Petersburg, succeeds Dr. Henry M. Snead, resigned, as Coroner of that city; and Dr. Francis N. Taylor, Petersburg, succeeds Dr. Snead as Jail Physician.

Dr. Robert Steele Hutcheson, Lexington, and Miss Mary Louise Moffett, Charlottesville, were married recently.

Dr. John Richard Saunders Jr., Richmond, and Miss Caroline Virginia Doyle, McKenney, were married recently.

Deaths

Dr. Maryus Curtis Oldham, Lancaster, aged 65, died recently.

Dr. Spencer Glas Gill, Norfolk, aged 58, died May 17.

Dr. John Morgan Biedler, Harrisonburg and Fort Lauderdale, Florida, aged 72, died recently.

Dr. Stephen Roszel Donohoe, Norfolk, aged 66, died recently.

Dr. Thomas Morton Raines, Wakefield, aged 73, died April 4.

Dr. Moses Peter Rucker, Bedford, aged 69, died recently of pneumonia.

Dr. Hunter McGuire Williams, North Garden, aged 67, died May 14 of a heart attack.

WEST VIRGINIA

West Virginia State Medical Association at its recent annual meeting elected the following to take office January 1, 1947: Dr. Wade H. St. Clair, Bluefield, President; Dr. James S. Klumpp, Huntington, First Vice-President; Dr. B. L. Page, Buckhannon, Second Vice-President; and Dr. T. M. Barber, Charleston, Treasurer, re-elected.

Dr. D. A. MacGregor, Wheeling, was elected West Virginia Governor of the American College of Physicians at its recent annual meeting held in May, succeeding Dr. Walter E. Vest, Huntington.

Dr. Ralph U. Whipple, Elkins, has moved to Rockville Centre, New York for the practice of urology.

Dr. Donald G. Hassig, Charleston, has moved to Middlebourne.

Dr. F. A. Irmen, Huntington, is on the medical staff of Raleigh State Hospital, Raleigh, North Carolina.

Dr. Otis G. King, Bluefield, recently released from military service, has resumed practice as a member of the staff at St. Luke's Hospital, Bluefield.

Dr. Louis Y. Peskoe, formerly of Boomer, recently released from the army, has accepted a two-year residency in internal medicine at Nichols General Hospital, Louisville, Kentucky.

Dr. George Marshall Lyon, Huntington, Captain, Medical Corps, U. S. Army, was recently awarded the Legion of Merit.

Deaths

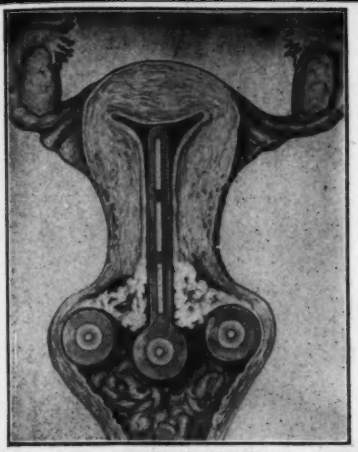
Dr. Welch England, Parkersburg, aged 44, died April 29 of a heart attack.

Dr. Mark Sutphin, Logan, aged 59, died May 7.

Dr. Alvah Londus Parsons, Putney, aged 63, died May 8 of heart disease.

Dr. Ozion Price Wilson, Moundsville, aged 68, died recently of coronary thrombosis and hypertensive heart disease.

IMPROVE YOUR RESULTS IN CANCER OF THE CERVIX



CONSISTENTLY high percentages of 5-year cures in Carcinoma of the Cervix are reported by institutions employing the French technique illustrated here. Ametal rubber applicators encase the heavy primary screens and provide ideal secondary filtration to protect the vaginal mucosa. Radium or Radon applicators for the treatment of Carcinoma of the Cervix and provided with Ametal filtration are available exclusively through us. Inquire and order by mail, or preferably by telegraph or telephone reversing charges. Deliveries are made to your office or hospital for use at the hour you may specify.

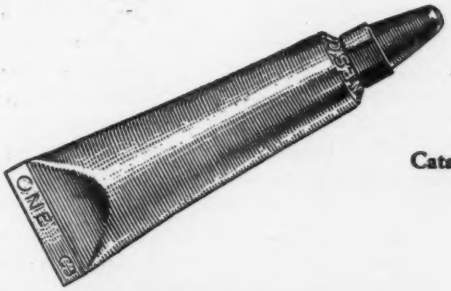
THE RADIUM EMANATION CORPORATION

GRAYBAR BUILDING Tel. MUrray Hill 3-8636 NEW YORK, N. Y.

"M. E. S. CO."

OPHTHALMIC AND NASAL

Ointments



Catalog and Price List
On Request

Manhattan Eye Salve Company

Incorporated 1063-65 Bardstown Road, LOUISVILLE 4, KENTUCKY

DEXTRI-MALTOSE

Is Tested Bacteriologically During Every Stage

BEFORE DRYING

AFTER DRYING

WHEN PACKED

EVERY day that Dextri-Maltose is manufactured, control samples for bacteriological analyses are secured from certain points in the process which experience has shown give an accurate picture of the bacteriological condition of the product in the different steps of its manufacture. As a result of experiment and long experience, it has been demonstrated that by exercising certain strict sanitary control measures and precautions, the bacteria count can be reduced to the point where the finished product approaches practical sterility. In infant feeding the physician protects the vitality and resistance of the organism in every way possible, by using pasteurized or boiled milk, boiled water, and sterilized bottles and nipples. He therefore naturally prefers to increase this margin of safety by specifying Dextri-Maltose which is bacteriologically safe. Here where the life and health of the infant and the reputation of the physician are in the balance . . . VALUE, NOT PRICE, IS THE TRUE MEASURE OF ECONOMY.

MEAD JOHNSON & COMPANY, Evansville, Indiana, U. S. A.

Please enclose professional card when requesting samples of Mead Johnson products to cooperate in preventing their reaching unauthorized persons

I WANT MORE PABLUM!
COPYRIGHT, 1945, MEAD JOHNSON & CO.
EVANSVILLE, INDIANA, U.S.A.

Abdec DROPS

8 IMPORTANT VITAMINS IN CLEAR, LIQUID FORM

FAT-SOLUBLE AND WATER-SOLUBLE VITAMINS IN ONE, STABLE NON-ALCOHOLIC SOLUTION

Eight important nutritive factors are contained in Abdec Drops, a truly comprehensive *liquid* multi-vitamin preparation. Abdec Drops may be added to milk, fruit juices, soups, cereal dishes, in fact to almost any food, without imparting objectionable taste.

Only a few drops are required daily for effective (and convenient) therapy of dietary deficiencies in infants, children and adults. Yet, the patient receives adequate amounts of the eight important vitamins in a stable, clear, non-alcoholic solution.

The average daily dose (0.6 cc.) of Abdec Drops contains:

1. **VITAMIN A** — 5000 U. S. P. units
2. **VITAMIN D** — 1000 U. S. P. units
3. **VITAMIN B_1** (Thiamine Hydrochloride) — 1 mg.
4. **VITAMIN B_2** (Riboflavin) — 0.4 mg.
5. **VITAMIN B_6** (Pyridoxine Hydrochloride) — 1 mg.
6. **PANTOTHENIC ACID** (as the sodium salt) — 2 mg.
7. **NICOTINAMIDE** — 5 mg.
8. **VITAMIN C** (Ascorbic Acid) — 50 mg.

Supplied in 15-cc. and 50-cc. bottles with special dropper calibrated for 0.3 cc. (infant) and 0.6 cc. (older child) doses.

Abdec DROPS

PARKE, DAVIS & COMPANY

DETROIT 32 • MICHIGAN